

H R H The Prince of Wales President of the World Motor Transport Congress

[Reproduced from a photograph [illegible]]

'orld Motor Transport Congress.

LONDON, 1927.

COMPLETE REPORT
of
PROCEEDINGS
on
NOVEMBER 14th, 15th and 16th,
1927.

Organiser HORACE WYATT,
21, Northumberland Avenue,
London, W.C 2.

PRICE 7/6

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WORLD MOTOR TRANSPORT CONGRESS,
LONDON 1927

President H.R.H. The Prince of Wales

Organised by the Society of Motor Manufacturers and Traders Ltd

ORGANISING COMMITTEE

Chairman: Sir Gerald Ireland [illegible] DSO, President of the Society of Motor Manufacturers and Traders

Mr J. W. Maclellan, Past President
Mr Albert Brown, Past President
Mr Frank Lanchester, Past President
C. J. Sealy Clarke, Past President
Sir Alfred Mays-Smith, Past President
Mr G. M. Young, Vice-President
Mr John Chilton, Member of Motor Agents Section
Mr L. Walton, Hon. Treasurer

Organiser: Mr Horace Wyatt, 21 Northumberland Avenue, W.C.2
(*Telephone No. Gerrard 6254*)

The Congress [illegible] under the auspices of the Bureau Permanent International des Constructeurs d'Automobiles (Secretary M. H. Cezanne, 51 Rue Pergolese, Paris)

In organising this Congress the Society of Motor Manufacturers and Traders has had the support of The Imperial Motor Transport Council (President H.R.H. Prince Arthur of Connaught, Chairman of Executive The Hon. Sir Arthur Stanley, G.B.E., C.B., M.V.O., Hon. [illegible] Mr Horace Wyatt)

A Comprehensive Index to the subjects dealt with at the Congress and to the Speakers is printed at the end of the Book

WORLD MOTOR TRANSPORT CONGRESS.

LONDON 1927

President

H R H THE PRINCE OF WALES

Chairman of Organising Committee ·

SIR GEORGE BEHARRELL D S O.

LIST OF COUNTRIES REPRESENTED TOGETHER WITH THE NAMES OF THE OFFICIAL DELEGATES.

Australia (The Commonwealth of).

(See also separate States in alphabetical order)

THE GOVERNMENT	Major Gen The Hon Sir Granville de L Ryrie C B K C M G V D High Commissioner
	Mr A S Fitzpatrick M Sc D I C.
	Mr F L McDougall
DEPARTMENT OF DEFENCE	Major G C Rowe Senior Military Representative of Commonwealth in London
ROYAL AUTOMOBILE CLUB OF AUSTRALIA	Mr Arthur H Davies
COMMONWEALTH ASSOCIATION OF AUTOMOBILE ORGANISATIONS	Mr W G Watson

Austria.

THE GOVERNMENT	Herr Karl Zeileissen Secretary to the Legation
FEDERAL RAILWAYS	Dr S F Mayer London Manager
VERBAND OSTERREICHISCHER AUTOMOBIL INDUSTRIELLER (Union of Austrian Motor Manufacturers) and DER VERBAND DER OSTERREICHISCHEN STRASSEN GESELLSCHAFTEN (Union of Austrian Road Associations)	Dr Georg W Hanel

Belgium.

THE GOVERNMENT (Ministry of National Defence)	Lieut Col H Nerinex Attaché Militaire
(National Railways Colonial Office Ministry of Agriculture)	M Joseph de Walque
(National Railways)	Mr Albert Mertz
TOURING CLUB DE BELGIQUE	M Paul Duchaine President
UNION ROUTIÈRE DE BELGIQUE	M Charles Lambert Member of Council

Bolivia.

THE GOVERNMENT	Colonel Carlos Banzer Military Attache

British Columbia.

THE GOVERNMENT	Hon F A Pauline Agent General

Canada (The Dominion of).

(See under separate Provinces in alphabetical order)

Ceylon.

THE GOVERNMENT (Government Railway	Mr C H Earley Assistant Divisional Transportation Superintendent
	Mr J Gray Factory Engineer

Chile.

THE GOVERNMENT	Senor Carlos Castro Ruiz Counsellor to the Legation
ASOCIACION DE AUTOMOVILISTAS DE SANTIAGO	Mr Agustin R Edwards Past President

China.

THE GOVERNMENT (Ministry of Communications)	Mr Tsooming Chiu
HONGKONG TRAMWAYS	Mr L C F Bellamy General Manager

Colombia.

THE GOVERNMENT	Dr Alejandro Lopez

Czechoslovakia

THE GOVERNMENT	Dr Frantisek Pavlasek Consul
ELEKTRICKE PODNIKY HL MESTA (Prague Electricity Supply)	Mr E Moelzer President of the Board of Directors Mr O Hadrbolec Vice President Ing A Pibl General Manager Dr K Sychravsky Manager of the Automobile Department
CZECHOSLOVAK AUTOMOBILE INDUSTRY	Herr Theodor Svoboda

Denmark.

THE GOVERNMENT Ministry of Public Works State Railways	Mr Ch de Buchwald Mr O H Munck Chief of Department Mr E Hyllestad Inspector of Traffic
AMTSVEJSINSPEKTORFORENINGEN I DANMARK (Association of Danish Departmental Inspectors of Bridges and Roads)	Mr S Ellert Mr J D Jespersen
COPENHAGEN ASSOCIATION OF MERCHANTS AND THE DANISH MOTOR AND CYCLE TRADERS ASSOCIATION	Mr Axel Semler
DANSK INGENIORFORENING (Danish Association of Engineers)	Mr Steffen Mohl
FORENEDE DANSKE MOTOREJERE (Danish Motor Owners Association)	Mr Aage L[illegible]ing First Vice President
FEDERATION OF DANISH INDUSTRIES	Mr G A Horneman
KONGELIG DANSK AUTOMOBIL KLUB (Royal Automobile Club of Denmark)	Mr Axel Dahl First Vice-President

Dominican Republic.

THE GOVERNMENT	Senor Don Carlos M Lamarche Consul and Charge d Affaires in London

Ecuador.

THE GOVERNMENT	Mr Lrrecto Chaccn Consul-General

Egypt.

THE GOVERNMENT (Ministry of Communications)	Ibrahim Zaki Bey, Director-General of the Department of Bridges and Roads
	Mohamed Abdallah Salem Effendi, Director of Mechanical Transport

Estonia.

THE GOVERNMENT	Mr R Mullerson Consul General

Federated Malay States & Straits Settlements.

NEGRI SEMBILAN MOTOR ASSOCIATION	Mr W L Iorwell Past President
PERAK MOTOR UNION	Major H F Nutter Past President

Finland.

THE GOVERNMENT	Lieut Col G Taucher Military Attache

France.

THE GOVERNMENT (Ministry of Public Works)	M le Gavrian Inspector General of Bridges and Roads
	M Loiret Chief Engineer of Mines
(Main Line Railways)	M H Polack Chief Engineer State Railways
	M Bardin Commercial Services Northern of France Railway
	M Aimé Place Northern of France Railway
(Office National du Tourisme)	M Mahieu Senator Member of Council
	M Regaud Managing Director
BUREAU PERMANENT INTERNATIONAL DES CONSTRUCTEURS D AUTOMOBILES	M H Cezanne Secretary

France—*continued*

Chambre de Commerce Française de Londres	M A Adeline Secretary
Chambre Syndicale des Constructeurs d'Automobiles de France	M H Cezanne
Société des Voyages et Hôtels Nord Africains	M Regnault Administrator General Secretary
Touring Club de France	M Maurice Vignon
Union des Véhicules Industriels	M Pierre Mariage
Union des Voies Ferrées et des Transports Automobiles de France	M L Bacqueyrisse Directeur General de l'Exploitation et des Services Techniques de la Société des Transports en Commun de la Region Parisienne
Tar and Benzole Committee of France	M Jean Bing Chief Engineer of the Benzole Association of France

Germany.

The Government (Ministry of Transport)	Geheimer Regierungsrat Pflug Counsellor
(Railway Administration)	Dr Scheu Director representing the Deutsche Reichsbahn Gesellschaft
	Dr Scheehl Director, representing the Deutsche Reichsbahn Gesellschaft
Automobil Club von Deutschland	Herr C O Fritsch President of Sporting Committee
Allgemeiner Deutscher Automobil Club	Herr Dipl Ing R Filser
	Herr Walter Hoffmeister, Secretary
Reichsverband der Automobil Industrie (German Federation of Motor Vehicle Manufacturers)	Herr Schippert
	Kommerzienrat Junk
	Dr Boeker
	Dr Ing Scholz Director
Deutscher Automobil Händler Verband (German Motor Traders Association)	Herr Ing Ernst Kleinrath President
	Herr Paul Staiger, Second Vice-President
	Herr Johannes Buschmann, Director
	Herr Fritz Riese

DEUTSCHER TOURING CLUB	Mr George Butler Morris
GESCHAFTSSTELLE FUR DEN DEUTSCHEN EISENBAHN KRAFTWAGEN VERKEHR (Office for German Railway Motor Traffic)	Reichsbahndirektor Dr Teubner Managing Director
INDUSTRIE UND HANDELSKAMMER ZU BERLIN (Berlin Chamber of Industry and Commerce)	Dr W Feilchenfeld
KRAFTVERKEHR DEUTSCHLAND GESELLSCHAFT	Herr Lorenz Stroebel
	Regierungsrat Sussdorf Managing Director
	Consul A Heimann Director
MITTELEUROPAISCHER MOTORWAGEN VEREIN (Mid European Motor Union)	Regierungsrat N Quarg
STUDIENGESELLSCHAFT FUR AUTOMOBILSTRASSENBAU (German Motor Road Construction Research Association)	Herr C O Fritsch

Gold Coast.

THE GOVERNMENT	
(Railways)	Mr T R Seddon Traffic Manager
(Transport Department)	Mr A H Cruickshank Engineer Transport Officer

Great Britain.

THE GOVERNMENT	
(Colonial Office)	Mr W E Hogg A R C Sc A M I C E Deputy Chief Inspecting Engineer to the Crown Agents
(War Office)	Major Gen G F Davies C B C M G C B E Director of Supplies and Transport
	Lieut Col A F B Harvey
	Capt C H Kuhne D S O O B E A M I Mech E
	Colonel K M Laird D S O

Great Britain—*continued*

	Lieut Col L Manton D S O O B E R E
	Lieut Col A D Owen D S O M I Mech E Chief Inspector of Mechanical Transport
	Colonel S C Peck C B D S O Director of Mechanization
(India Office)	Major E H W Partridge
(Board of Trade)	Sir W H Clark K C S I C M G Comptroller General Department of Overseas Trade
	Mr L A Paish Assistant Director Department of Overseas Trade
	Mr C E G House M B E Department of Overseas Trade
(Post Office)	Brig Gen I H Williamson C B C B E, Director of Postal Services
(Ministry of Transport)	Sir Henry P Maybury K C M G C B Director General of Roads
	Lieut Col C H Bressey C B E Chief Engineer
	Mr E S Perrin B Sc Engineer of the Department
	Mr I G Turner B Sc Engineer of the Department
	Mr H H Piggott Assistant Secretary
(Empire Marketing Board)	Mr R H Brackenbury
(Commissioner of Police for the Metropolis)	Mr Frank Elliott C B Assistant Commissioner
ASSOCIATION OF BRITISH CHAMBERS OF COMMERCE	Sir Edward Manville J P Past President
	Mr A R Atkey J P
	Mr J J Hughes
	Mr George H Wright
AUTO CYCLE UNION	Mr T W Loughborough Secretary and Secretary General of the Federation Internationale des Clubs Motocyclistes
AUTOMOBILE ASSOCIATION	Mr Chas McWhirter Chairman Member of the Executive of the Conseil Central du To[illegible] Internati[illegible]al

AUTOMOBILE ASSOCIATION (*continued*)	Mr Stenson Cooke Secretary Member of the Executive of the Alliance Internationale de Tourisme Mr E H Fryer Deputy Secretary and Road Manager Mr A Dunscombe Allen Head of Touring Department
BRITISH IGNITION APPARATUS ASSOCIATION	Mr G Lister
BRITISH CYCLE AND MOTOR CYCLE MANUFACTURERS AND TRADERS UNION	Mr Boultbee Brooks President Mr H R Watling Director
COMMERCIAL MOTOR USERS ASSOCIATION	Mr E S Shrapnell Smith C B E M Inst T President Mr G L Artless Mr R W G Barnett M.Inst T Mr J L Clewes M Inst T Capt C Davenport Mr J B Osler O B.E M.Inst T Major James Paterson M C Major R A B Smith A C G I Mr F G Bristow F C I S General Secretary
FEDERATION OF BRITISH INDUSTRIES	Major Gen S S Long C B
GREAT WESTERN RAILWAY	Mr F C A Coventry O B E Superintendent of Road Transport
IMPERIAL MOTOR TRANSPORT COUNCIL	The Hon Sir Arthur Stanley G B E C B M V O Chairman Mr Horace Wyatt Honorary Secretary
INSTITUTE OF TRANSPORT	Mr Roger T Smith B Sc M Inst C E M I E E President
INSTITUTION OF AUTOMOBILE ENGINEERS	Major E G Beaumont President Mr L A Legros Mr H F L Orcutt Mr L H Pomeroy Mr W J Tennant Sir John E Thornycroft K B E M Inst C.E Mr Basil H Joy Secretary

London and Provincial Omnibus Owners Association	Lieut Col H I Robinson Maidstone and District Motor Services Ltd
	Mr B Smith National Omnibus & Transport Co Ltd
	Mr E R Soames Tramways (M E T) Omnibus Co Ltd
London Midland & Scottish Railway	Mr Ashton Davies General Superintendent Passenger Commercial
	Mr J Pike Goods Commercial Manager
London & North Eastern Railway	Mr J A Wickham Assistant General Manager
Mechanical Transport Associations	Mr E S Shrapnell Smith C B E M Inst T Chairman of Standing Joint Committee
Motor Agents Association	Mr G W Lucas President
Motor Legislation Committee	Mr Chas McWhirter Chairman
	Mr Albert E Cave J P Secretary
Roads Improvement Association	Rt Hon Lord Montagu of Beaulieu K C I E G C S I Vice President
	Mr W Rees Jeffreys Chairman
	Mr J H Simon
	Mr Wallace E Riche General Secretary
Royal Agricultural Society of England	Mr T B Turner Secretary
Royal Automobile Club	The Hon Sir Arthur Stanley G B E C B M V O Chairman
	Mr Mervyn O Gorman C B Vice Chairman
	Colonel R E Crompton C B R E
	Comdr F P Armstrong O B E Secretary
Royal Scottish Automobile Club	Sir James Adam K C
Society of Motor Manufacturers & Traders	Sir George Beharrell D S O President
	Mr R W Maudslay Past President
	Mr Albert Brown Past President
	Mr Frank Lanchester, Past President
	Colonel J Sealy Clarke Past President

Society of Motor Manufacturers & Traders (*continued*)	Sir Alfred Mays Smith Past President
	Mr John Chilton J P Member of Motor Agents Section
	Mr G M Young B Sc Vice President
	Mr L Walton Hon Treasurer
	Lieut Col A Hacking D S O M C Secretary
Southern Railway	Mr Gilbert S Szlumper General Manager's Assistant

Guatemala.

The Government	Mr David Bowman Consul

Holland.

Rijkswaterstaat	Mr G J van den Broek Engineer Secretary of Road Committee
Dutch Railways	Mr R G M A Heg Director of the Automobile Transport Association
Municipal Motor & Transport Department of Rotterdam	Dr Eng M F de Bruyne Director
	Mr J L G Kohler Engineer
Police Department of Rotterdam	Mr A H Sirks O B E Chief of Police
	Mr B G Meyer Chief of Traffic Department
Municipality of Utrecht	Col D Schuitemaker Chief of Police
	Mr J P Weyburg Police Inspector Traffic Division
A N W B Toeristen Bond voor Nederland	Col H W O de Bruyn
Bond van Bedrijfsauto houders in Nederland (Dutch Commercial Motor Users Association)	Mr M A Beers Vice President

Hungary

State Railway Motor Transportation	Mr T S Haltenberger
Royal Automobile Club of Hungary	Mr A J Kirschner
	Mr I S Sissovics
Hungarian Touring Club	Mr Bela Vermes President
	Mr E Kirschknopf General Secretary

India.

THE GOVERNMENT	
(Army)	Brevet Major R K Hubbard O B E A M I Mech E M I A E Chief Inspector of Mechanical Transport of the Army in India
(Posts and Telegraphs)	Mr C H Malan O B E I C S
(Store Department)	Major E H W Partridge
(Railway Department)	Colonel C Walton Agent North Western Railway of India
	Mr D S Burn Chief Traffic Manager Great Indian Peninsular Railway
(India Office Military Department)	Colonel T M Hutchinson D S O, O B E R A S C M T Advisor
INDIAN CHAMBER OF COMMERCE	Mr R K Bomanji
INDIA ROADS AND TRANSPORT DEVELOPMENT ASSOCIATION	Mr G Sutton Jones
MAIL CARRYING SERVICES	Mr C Rajani

Iraq.

THE GOVERNMENT	Muzahim Bey al Pachachi Diplomatic Agent
DESERT MOTOR SERVICES	Mr Norman Nairn

Irish Free State.

THE GOVERNMENT	Mr T J Kiernan
SOCIETY OF IRISH MOTOR TRADERS	Mr F M Summerfield

Italy.

STATE RAILWAYS	Ing Cav A Perfetti
	Comm Ing L Belmonte
	Comm Ing Ernesto Ferrero
MINISTRY OF PUBLIC WORKS	Comm Ing I La Valle
ROYAL AUTOMOBILE CLUB OF ITALY	S E Senatore Crespi President
TOURING CLUB OF ITALY	
	sentative
UNIONE ITALIANA FABBRICHE AUTOMOBILI	Signor Ugo Nanni

Japan.

THE GOVERNMENT	
(Department of Communications)	Mr Shigeru Komatsu Secretary
(Department of Home Affairs)	Mr Kaneomi Sutoh
(Department of War)	Major Totaro Nakashima Artillery Military Attaché
	Major Katsuo Torinoumi A S C Military Attaché
(Government Railways)	Mr Sonosuke Nagasaki
	Mr Sinjuro Yamada
TOKIO MOTOR TRANSPORT ASSOCIATION	Mr H Ogura
	Mr T Otaki

Java.

STATE RAILWAYS	Mr N Kriens Inspector

Kenya and Uganda.

PUBLIC WORKS DEPARTMENT	Mr F A Buckley B A B E A M I C E Executive Engineer
RAILWAY ADMINISTRATION	Mr W McHardy O B E

Lithuania

THE GOVERNMENT	Mr K Gineitis Consul

Mauritius

THE GOVERNMENT (Public Works & Surveys)	Major L F Regnard R E Director

Mexico.

	Senor Manuel J de Negri First Secretary of the Legation

Newfoundland.

THE GOVERNMENT	Capt Victor Gordon C M G High Commissioner

New South Wales.

THE GOVERNMENT	Mr Henry C Jenkins A M I C E Consulting Engineer for New South Wales

New Zealand.

THE GOVERNMENT — Mr Ronald J Harvey M I E E Mem A I I E Consulting Engineer to the Government

Nigeria.

(Public Works Department) — Mr F S Robinson Assistant Director
Mr S P Lightband

NIGERIAN RAILWAY — Mr F A Pope Divisional Superintendent

Northern Ireland.

THE GOVERNMENT
(Ministry of Commerce) — Mr W D Scott C B E Secretary
(Ministry of Home Affairs) — Major Geo A Harris C B E D S O

Norway.

ROYAL AUTOMOBILE CLUB OF NORWAY — Mr Benjamin Vogt Jr

Nova Scotia.

THE GOVERNMENT — Hon John Howard Agent General

Ontario

THE GOVERNMENT — Hon Wm C Noxon Agent General

ONTARIO MOTOR LEAGUE — Mr H K Carruthers Secretary of the Automobile Club of Ottawa and the Ottawa Board of Trade

Paraguay.

THE GOVERNMENT — Mr Rafael Fuller
Mr José A Bozzano (h)

Persia.

THE GOVERNMENT — Mr A Ardeshir First Secretary of Legation

Peru

THE GOVERNMENT — Senor Carlos Holguin de Lavalle First Secretary to Legation
Senor Emilio del Solar First Secretary to Legation

MUNICIPALITY OF LIMA — Senor G Vargas Vice Consul

Poland.

THE GOVERNMENT (Ministry of Public Works Roads Department)	Mr Inz M S Okecki
(Ministry of Communications)	Prof Jozef Gievsztor
MUNICIPALITY OF WARSAW	Mr Kazimierz Tyszka (Former Minister of Communications)
" "	Mr Antoni Dabrowski
AUTOMOBILE CLUB OF POLAND WARSAW	Mr Antoni Dabrowski

Quebec.

THE GOVERNMENT	*Hon L J Lemieux Agent General*

Queensland.

THE GOVERNMENT	Hon John Huxham Agent-General

Rhodesia.

THE GOVERNMENT	Sir Charles Metcalfe Bt Consulting Engineer to the Government

Roumania

THE GOVERNMENT	M D Hiott Secretary to Legation

San Marino Republic.

THE GOVERNMENT	Commendatore M A Jamieson Consul General

Siam.

THE GOVERNMENT	Luang Jamni Kolakarn First Secretary to Legation
BANGKOK INTERNATIONAL CHAMBER OF COMMERCE	Mr C T Cox

Sierra Leone.

THE GOVERNMENT (Public Works Department)	Mr W G Tomlinson Executive Engineer

South Africa.

(See also separate Provinces in alphabetical order)

THE GOVERNMENT	Mr G G Elliott Advisory Engineer
ROYAL AUTOMOBILE CLUB OF SOUTH AFRICA	Mr Mervyn O Gorman C B
NATAL AUTOMOBILE CLUB	Mr W A Holwill Past Chairman
SOUTH AFRICAN INSTITUTION OF ENGINEERS	Mr F H Clifford
SOUTH AFRICAN MOTOR TRADERS ASSOCIATION	Capt W D Irvin C B E R N ex Councillor

South Australia

THE GOVERNMENT	Hon J Lloyd Price Agent General
S A RAILWAYS	Mr L J Watson Inspecting Engineer

Spain.

THE GOVERNMENT	Senor Don Jesus Navarro de Palencia Agricultural Attaché to Embassy

Sweden.

THE GOVERNMENT	Mr Emil G Sahlin Consul General
ROYAL AUTOMOBILE CLUB OF SWEDEN	Mr Gunnar Lindmark

Switzerland

TOURING CLUB SUISSE	M Adrien Lachenal Member of Swiss Parliament

Tasmania.

THE GOVERNMENT	Lieut Col The Hon R Eccles Snowden Agent General

United States.

THE GOVERNMENT (Department of Commerce)	Mr Wm Lee Cooper Commercial Attaché to the Embassy
	Mr H H Kelly Automotive Trade Commissioner to Europe
	Mr William M Park Trade Commissioner to United Kingdom

AMERICAN AUTOMOBILE ASSOCIATION	Mr Cortlandt Bishop European Representative
	Mr J D Ryan Director Foreign Department
AMERICAN CHAMBER OF COMMERCE	Mr G M Cassatt Director
	Mr Walter Mangum Director
	Mr H R Amory Secretary
MOTOR & ACCESSORY MANUFACTURERS ASSOCIATION	Mr Henry L Horning President
NATIONAL AUTOMOBILE CHAMBER OF COMMERCE	Mr G I Bauer Manager of Foreign Trade Department
SOCIETY OF AUTOMOTIVE ENGINEERS	Mr David L Bacon Supervisor of Automotive Equipment New York Newhaven and Hartford Railroad
	Mr J B Fisher
	Mr Henry L Horning Past President
	Mr Mason P Rumney President of Detroit Railway and Harbour Terminals Company
	Mr Coker F Clarkson Secretary

Victoria.

THE GOVERNMENT	Mr Frederick Coates Engineer to the Government
ROYAL AUTOMOBILE CLUB OF VICTORIA	Mr Brunel Kay Vice President and Past President
CHAMBER OF AUTOMOTIVE INDUSTRIES	Mr W Howard Lewis Vice President and Past President

Western Australia.

THE GOVERNMENT	Hon W C Angwin Agent General

Zanzibar

THE GOVERNMENT (Public Works Department)	Mr S I Bland Assistant Director

WORLD MOTOR TRANSPORT CONGRESS,

LONDON, 1927

SUMMARY OF PROCEEDINGS.

MONDAY, NOVEMBER 14th.

10.30 a.m.—First Session of the Congress

At 10 30 a m , Sir George Beharrell, D S O , President of the Society of Motor Manufacturers and Traders Ltd took the chair and welcomed the Delegates on behalf of the Society as the organising body of the Congress

He was accompanied by Lt -Col The Rt Hon Wilfrid Ashley, M P , Minister of Transport, who welcomed the Delegates on behalf of the British Government

Subject for Discussion —

" Motor Transport as an Instrument of Development of World Resources "

12.45 p.m.—Reception.

Individual Reception of the Delegates by Sir George Beharrell, D S O , and by the Rt Hon Sir William Joynson-Hicks, Bt , M P., the Secretary of State for Home Affairs, on behalf of the British Government

1.0 p.m.—Luncheon.

Chairman Sir George Beharrell, D S O

After luncheon the Rt Hon Sir William Joynson-Hicks, Bt , M P , Secretary of State for Home Affairs, addressed the Delegates

2.30 p.m.—Second Session of the Congress.

Chairman: The Hon. Sir Arthur Stanley, G.B.E., C.B., M.V.O., Chairman of the Royal Automobile Club and of the Imperial Motor Transport Council, etc.

Subject for Discussion:—

"Road Construction and Improvement in Relation to the Development, Efficiency and Economy of Road Transport."

TUESDAY, NOVEMBER 15th.

10.30 a.m.—Third Session of the Congress.

Chairman: Sir Edward Manville, J.P., Past-President of the S.M.M. & T., Past-President of the Association of British Chambers of Commerce, Vice-President of the Federation of British Industries, Joint Chairman of the National Industrial Alliance, etc.

Subject for Discussion:—

"The Development of Motor Vehicles Suitable for Service on Bad Roads and for Cross-Country Use."

1.0 p.m.—Luncheon.

Chairman: Sir Edward Manville, J.P.
After luncheon Maj.-Gen. The Hon. Sir Granville Ryrie, C.B., K.C.M.G., V.D., High Commissioner for the Commonwealth of Australia, addressed the Delegates.

2.30 p.m.—Fourth Session of the Congress.

Chairman: M. Adrien Lachenal, Member of Swiss Parliament and Member of the Administrative Committee of the Touring Club Suisse.

Subject for Discussion:—

"The Improvement of Facilities for International Travel by Road."

WEDNESDAY, NOVEMBER 16th.

10.30 a.m.—Fifth Session of the Congress.

Chairman Maj-Gen S S Long, C B, Chairman of the Traffic Committee of the Federation of British Industries, President of the Mansion House Association, and Chairman of the Traders' Co-ordinating Committee on Railway Matters, etc

Subject for Discussion —

"The Necessity for Co operation between Road and Rail Transport"

1.0 p.m.—Luncheon.

Chairman Colonel J Sealy Clarke, Past-President of the Society of Motor Manufacturers and Traders, etc

After luncheon, Lt-Col The Rt Hon Wilfrid Ashley, M P, Minister of Transport, addressed the Delegates

2.30 p.m.—Sixth Session of the Congress.

Chairman Sir George Beharrell, D S O, President of the S M M & T

This Session was devoted to a review of the work of the previous sessions, consideration of resolutions arising therefrom, and proposals tending to increase the utility of this and any future Congress

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THURSDAY, NOVEMBER 17th.

11 0 a.m—Official Visit of the Delegates to the Exhibition of Commercial and Public Service Motor Vehicles at Olympia The Delegates were received at the Hammersmith Road Entrance by Mr S S Guy, Chairman of the Exhibition Committee and of the Commercial Vehicle Section of the Society of Motor Manufacturers and Traders, supported by other members of the Council and of the Exhibition Committee of the Society

FIRST SESSION *of the*

World Motor Transport Congress

HELD AT

THE SAVOY HOTEL, LONDON, W.C.1,

ON

Monday, November 14th, 1927.

SIR GEORGE BEHARRELL, D.S.O.
(President of the Society of Motor Manufacturers and Traders Ltd)
in the Chair

Subject of Discussion: "Motor Transport as an Instrument of Development of World Resources."

The CHAIRMAN Gentlemen, I regard it as a very great privilege and honour to be allowed to welcome, on behalf of the Society of Motor Manufacturers and Traders, the delegates to this important Congress I regard it as a distinct honour to myself because I have been associated with transport in one form or another the whole of my life Therefore, this is a Congress which appeals to me probably more than any other Congress which I have previously attended in any capacity Previous Congresses have been held, as you know, in New York and delegates from the Society of Motor Manufacturers and Traders have a very lively recollection of the hospitality which they received whilst in that city, and the great interest which the papers read at those Conferences aroused This Congress marks for us a red letter day It is the first Congress of its kind which has ever been held in Europe, and I am informed that never has there been such an attendance of representatives from so many nations and

Governments We have been particularly proud that the Congress has evoked such a wonderful reception We are honoured by 250 officially appointed delegates representing upwards of 60 countries That I think speaks for itself as to the wide interest which this Congress has aroused The programme as you will observe is a most ambitious one

The subjects for discussion are interesting and instructive The range of subjects is a wide one and I for one do not see how we shall do full justice to those subjects in the limited number of sessions which have been set apart for this Congress You have only to look at the papers which have been submitted to see how great is the interest Take for example the one for this morning namely Motor Transport as an Instrument of Development of World Resources That brings to mind an old saying that transportation is civilisation and I feel sure that the more transportation can be developed the greater will be the march of civilisation in those parts of the world not now favoured with any adequate means of transportation Again take the countries from which the papers have been submitted we have Australia China France French Northern Africa Germany Great Britain Hungary India Palestine and South Africa and last but only so because of its position in the alphabet the United States of America These papers I am sure lead us to expect very lively discussions on the various subjects

We are fortunate this morning in having with us Lieut Col the Rt Hon Wilfrid Ashley who will welcome the delegates on behalf of His Majesty s Government and I am sure no more appropriate representative of the Government could have been found to fill that office He is as you may know our Minister of Transport a Ministry which is getting more and more important and has probably more to do with the development of motor transport in this country than any other body We are very fortunate that this Congress immediately precedes the Commercial Vehicle Exhibition at Olympia You are already aware that an invitation has been conveyed to all the delegates to this Congress to attend the Exhibition and I hope it will be possible to do so In my recollection there never has been so much interest evidenced in a Show in advance as there is in this case Every inch of space has been taken and I am quite sure not one of us will visit the Exhibition without profit or at any rate spending a most interesting time I will now ask Col Ashley to say a few words on behalf of the Government

Lt Col The Rt Hon WILFRID ASHLEY M P (Minister of Transport) Mr Chairman and Gentlemen I confess that when I

[illegible] industry of civilisation because without transportation all civilisation as [illegible]

know it at any rate must come to an end His Majesty's Government is proud to have you in their midst It is proud to have such an important Congress making its deliberations in the chief city of the Empire and undoubtedly the problems which you will have to discuss—world problems and British Empire problems—are some of the most insistent which any Congress could possibly have to deal with We are living in an age of rapid development in all that concerns movement of man, beast or goods Railways are being developed and road transport which is your special province is expanding with a rapidity which is the despair of my officials and myself as far as roads in this country are concerned because no sooner do we build a new road or re construct an old one than it becomes crowded with such a number of vehicles that all the good that we have done is largely abolished in six month s time

We of course in this country cannot compete with that marvel lous development of road transportation which we see across the Atlantic in that great Republic of the United States I am speaking without reference to recent books but there I think they claim to have one automobile to every seven or eight of the population Here we have the miserable total of only one auto mobile to every twenty six of the population but our numbers are expanding and it is true our revenue is expanding in order to meet that new need But more money is needed I am sure you will agree Mr Chairman for our roads and for our trans portation generally The great problem to my mind to which any thinking man must turn attention is how best the great railway systems of the world can be co ordinated and fairly co ordinated with road transportation In my opinion there is no necessary antagonism—there should be no antagonism—between rail and road transportation Both are necessary for the carrying of passengers and goods in any well ordered country, and though it may seem at first blush that there must be diversity of interest between these two great industries I am quite sure that a little care and tact a little consideration and sound business capacity will enable the heads of the two interests to work out some scheme whi

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wasteful and co ordination would enable that wasteful com petition to be eliminated so that both these industries will I am sure be able to carry on successfully and financially successfully if the Government of the day when it has explored the problem will pass some law to prevent overlapping and waste Gentlemen I thank you very much for coming here to day and I offer you a cordial and wholehearted welcome on the part of His Majesty s Government I will now not stand between you and your deliberations which are so important and which I trust will have far reaching consequences

The CHAIRMAN The subject for discussion this morning is "Motor Transport as an Instrument of Development of World Resources" We are very fortunate in having with us this morning Mr Ormsby-Gore, the Under-Secretary for the Colonies, who will open the discussion on this subject

The Rt Hon W G A ORMSBY-GORE, M P I count it a great honour that you should ask me as a representative of the British Colonial Office to open the discussion on the first set of papers to your Congress It is perhaps fitting, however, as the British Colonial Empire, which must be distinguished from the great self governing Dominions, is very largely still an undeveloped Empire The greater part of it in area is in tropical Africa, and the greater part of the population is in tropical Africa, the progress, civilisation and all the commercial development in these countries literally begin and end with problems of transport. It is quite impossible for man to conquer the tropics, either the problems of health or administration, and still more the problems of production and commerce, without the prime basis of transportation systems When I was asked to deliver the opening address before this Congress there came to my mind a stock question in Greek History papers which used to cause small boys considerable inconvenience The question was, "Illustrate by reference to Greek History that the sea unites—the land divides" The question, by no means an easy one, might have been made less difficult if we had been asked to illustrate this general truth by reference to the history of the modern world

It requires but a moment's thought to account for the fact that transport by sea is in many ways, and at any rate in the earlier stages of a country's development more easy than transport by land The sea is a ready-made road, across which goods may be transported in any direction, rivers too, in so far as they are navigable provide a ready made road In either case only the vehicle of conveyance requires to be provided But before land transport can be developed to an extent commensurate with the needs of any community, not only is a vehicle of conveyance necessary, but some system of roadways upon which the means of conveyance may move Mainly because transport by sea and river is, for this reason, more easy than transport by land, countries are normally developed in the first instance along their seaboard and rivers, but as countries develop it is of ever increasing importance that their interiors should be rendered accessible and opened up in order that the fullest use may be made of their resources, and it is from this point of view that we are met here to day—*in order to consider motor transport as a means of development of world resources.*

The essential problem of all forms of transport is "How can we reduce the ton-mile cost?" Every reduction of ton mile cost by whatever means it is effected, will open up a larger area of country for development It is the cost of moving goods to market that renders so many commodities unmarketable, or

alternatively areas unprofitable from the point of view of development Every additional mile that can be brought within range of a market without additional cost represents a large area for each additional point brought within range serves as a collecting centre tapping a wider circle I will illustrate what I have been saying by my own personal experience of travel in Africa For many years if not for centuries there has been a trade between Europe and say the West Coast of Africa but it was not until thirty years ago that that trade ceased to be in effect a trade between the narrowest margin of coast line along the West African coast and the outside world because it was about thirty years ago that the first railways were begun in Africa Incidentally that leads me to say that such countries were remarkable in that although they had a very large population they had never learned the art of using a wheeled vehicle of any kind and so the history of development of the interior of these great countries has been entirely a development of the last thirty years

About two years ago I reached the capital of one of the former interior Empires of West Africa a place near Sokoto We lived in mud huts and they were reasonably comfortable but there were great demands for a proper hospital and things of that kind in this large city and I said What is the difficulty? They told me the difficulty was that cement in Sokoto was £7 sterling per bag and the reason for that was because cement cannot be produced in Nigeria

It has to be imported from Europe or from the outside world it arrives at the port of Lagos and has to go up one of the only two lines of railway that travels a country seven times the size of England and when it has gone 600 miles along the railway it has to be put on a motor lorry and then carried another 250 miles to Sokoto In the tropics if you can work a motor lorry at 1s per ton mile you are lucky under the tropical conditions of bad roads which prevail and the result is that you have to pay £12 10s a ton on every article that you take to Sokoto from the nearest railway station That gives you some indication of the difference between a densely populated country where goods are actually produced and the interior of a country like Africa and under these conditions it is obvious that unless goods can stand these transportation charges every single penny or half penny that can be taken off the cost per ton of material brings into the arena of commerce and production an increasing number of buyers and an increasing area of land capable of producing wealth

But before going any further in my remarks I would like to make it clear that we should be wrong if we exclude from consideration all other forms of transport except the road motor I know that the road motor is the prime object of consideration by this Congress but it must be remembered that just as ships can transport commerce at a price per ton mile lower than any

known means of road transport so where long distances and commodities in bulk are concerned no form of road transport can at present be expected to compete with railways for cheapness per ton mile We should therefore always bear in mind that the development of the roads and motor transport should be—to use a blessed word—a co ordinated development the object being ultimately in nearly every case to get commodities to railways for a long haul and so to the sea for in the present state of the world s trade and civilisation sea transport is the ultimate destiny of possibly a large proportion of the goods produced in nearly every country In other words road development schemes should be planned by reference to existing or projected railways just as vice versa projected railways should be planned by reference to road schemes so that a new railway may as early as possible be serving and be fed from the largest possible area The railway should be as it were the main river and roads should be there as quickly as possible to serve as tributary streams Road motor transport is however of such importance as a subject *per se* that nothing but good can come from a discussion of the subject by representatives who have made a study of the subject in many countries and under varied conditions

In connection with road motor transport there are as I have already pointed out at least two factors to be considered—the vehicle of conveyance and the road upon which it is to travel One might well add a third for the question of fuel may very possibly be of equal importance In countries which enjoy a high

highest and unless local supplies of oil are discovered it may well be the case that only by means of the utilisation of some other form of fuel will the cost per road mile be reduced to a sufficient extent to make a marked effect upon the area which can suitably be brought into touch with new or important markets In portions of Africa for example both east and west power alcohol

neation and adaptation before the ideal form of motor for such countries is achieved I am thinking now of the back blocks of Australia the interior of Africa or parts of India and the interior of the great Continents

Of the other two factors let me refer first to the vehicle During the comparatively short period motor vehicles have existed very great alteration in design has taken place both in external and internal construction of cars and lorries as also their price It would be true to say that whereas a

alternatively areas unprofitable from the point of view of development Every additional mile that can be brought within range of a market without additional cost represents a large area for each additional point brought within range serves as a collecting centre tapping a wider circle I will illustrate what I have been saying by my own personal experience of travel in Africa For many years if not for centuries there has been a trade between Europe and say the West Coast of Africa but it was not until thirty years ago that that trade ceased to be in effect a trade between the narrowest margin of coast line along the West African coast and the outside world because it was about thirty years ago that the first railways were begun in Africa Incidentally that leads me to say that such countries were remarkable in that although they had a very large population they had never learned the art of using a wheeled vehicle of any kind and so the history of development of the interior of these great countries has been entirely a development of the last thirty years

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of it It is equally true to say that there is as much wealth in the soil as has ever come out of it and it is to that motor transport to which we already owe much development that we shall look in ever increasing measure for its development in future It must not be forgotten that motor transport is valuable for development not only owing to its primary capacity to transport people and goods but also because of its effects of a secondary nature It is quite remarkable to see how the desire to possess a motor car or a motor bicycle has stimulated people to earn and to activity This factor is a thing that should be borne in mind in human incentive to effort It is quite clear that we are in an age when change
ingly important
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bution to make towards the welfare and the greater happiness of humanity With this short introduction I will leave the further consideration of the papers to the delegates

Mr C E BAUER (National Automobile Chamber of Commerce) World wide prosperity will be brought about through increase in human earning power and the lowering of living costs as results of motor transport Prosperity in any country develops as people become more efficient as regards productive output and thereby justly acquire greater earning and consequently greater buying power This latter then enables increased activities in all the various human endeavours of production and distribution Gradually as the increased earning power is passed along in the form of purchases does prosperity develop In this process motor transport has become a very vital agency

Wise workers for instance have realised that machinery exten
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activities just because of this greater productive output

Travelling salesmen justly become entitled to greater compensation if by use of an automobile they are able to visit more customers and consequently increase their sales Many firms have therefore found it more than profitable to supply their travelling representatives with cars

The degree of productive efficiency of a people will also depend somewhat on the educational facilities that are made available to the greater number Centralised schools caring for large numbers of pupils can necessarily be better equipped as regards teachers than can many small school houses scattered here and there Already 33 000 such centralised schools have been made possible in the United States because of facilities offered by automobiles and buses to convey children to and from schools located at considerable distances from home

Prosperity results however not only from greater productive output of the people whose time has been put to greater usefulness by means of the automobile and activities incident thereto Prosperity can also be affected by reducing the costs of commodities so that a bigger demand can be created for them among the broader masses with less purchasing power In this latter respect motor transport has also proved effective and has done much to bring about a greater circulation of goods and money

The working man able to live in the country and still go to work every day in the city as a result of motor transport will not need to expend as much for rent and food as one living solely in the city The rent of a family living in the suburbs in parts accessible to New York by motor transport for commuting purposes will be about 50 per cent less than that of the city dweller More money remains therefore for purchase of other commodities in quantities sufficiently important to stimulate collectively the commerce of small lines of the nation

But the automobile with its related activities has also a tendency to create prosperity Mass production has not only brought the price of the automobile within reach of many people but the use of such a large number of vehicles has also tended to make for more economic construction of highways Bigger demand for materials has made for more efficient production of cement and similar products

It may be said that the automobile has definitely become a stabiliser of prosperity in the United States With 22 million cars in circulation the tax per unit need be but small and the total revenue each year will nevertheless exceed 700 000 000 dollars (£140 000 000) In 30 years 21 000 000 000 dollars (£4 200 000 000) or as much as the total war debt will have been received This money could in form of bonds be put in circulation any [illegible] interest and amortisation [illegible] large number of people on th[illegible] at circulation of money in all [illegible] sperity would resume its cou[illegible] ted States in this regard ca[illegible] countries in varying degrees

It is only necessary to allow the automobile to serve its proper functions It will then help to increase efficiency of population by its time saving features It will also help to reduce cost of commodities to consumers—thus bringing about a greater quantity demand with its resultant blessings to all

These two prime factors then attainable in good measure through motor transport can be made to spell prosperity throughout the world

Mr F L McDougall presenting the paper prepared by the Development and Migration Commission of Australia said The High Commissioner has asked me as representing the Development and Migration Commission of Australia to introduce this

paper (see Section II) Col Ashley who is the representative of a very old country pointed out this morning that the chief need is for co ordination between rail and road motor services We have also heard Mr Ormsby Gore who represents the undeveloped countries of the Empire stressing the importance of development of motor transport and we have just heard Mr Pauer telling us of the importance of motor transport from the point of view of human earning power and lowering of living costs Australian transport problems however are similar to those of South Africa and of those parts of East Africa and South America which are not mountainous For this reason I shall not hesitate to invite the Congress to study the Australian problems in considerable detail I want to point out that in presenting this memorandum the idea of the Development and Migration Commission was to present the problems of development in Australia particularly as regards agricultural development I do not speak in any sense as a person with any technical knowledge of motor transport

What is the factor that really hinders the expansion of primary development in a country like Australia to day? If I may take one example the question of wheat development and wheat yield in Australia it has been conclusively proved that so far as soil and climate are concerned there is absolutely no reason why the

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ing railway lines owing to the capital cost and up to the present moment we have not been able to evolve a satisfactory system of feeding the railways by means of other forms of transport What applies to wheat applies to a very large extent to our pastoral industries and as pointed out in the paper this also affects the other great primary industry namely mining The key of the successful development of mining in Australia and other important industries is transport and the question we come to is what form of transport is really needed

The paper points out that so far as railways are concerned we in Australia have come to a rather curious paradox Australia shares with Canada the honour of having the largest mileage of track per thousand of population but it has the lowest mileage of track per thousand square miles and that will perhaps show the Congress very clearly the immense transport problem of an area such as Australia which is as large as the United States but has only six million inhabitants The greatest railway development problem in Australia at the moment is the unification of the gauges Preliminary steps have been taken towards solving that problem and the cost is estimated at £21 000 000 As regards roads the paper sets out in a very effective manner the road conditions in Australia People who are accustomed to the roads of Europe and Great Britain cannot have any conception of the immense problem which faces

Australia so far as roads are concerned. We have an enormous area with the people scattered through it, and although we are endeavouring to develop the road system, this development must be very slow. The conditions in many parts of the Continent of Australia appear to call for the partially tracked vehicle or other types of vehicle which can travel along the earth roads without doing too much damage to them. At the present moment on the whole, the six wheeler is doing good work in Australia although it is too early to give any reasoned view with regard to it. We are very interested in the tracked vehicle and it is possible that Australia will be able to provide the whole world with one of the hardest tests of any country because we believe that in our black soil plains in wet weather we have a country which is probably more difficult than anywhere else in the world. We shall therefore thoroughly welcome any ambitious manufacturer who desires to test out his latest ideas on our black soil plains in wet weather. Again, there is the possibility in which we are immensely interested of the road train as a feeder to our railways. However there will be considerable difficulties to be overcome before we can really expect any very large development of motor transport to assist in the development of Australian primary industries.

I do not propose to deal with any of the technical aspect of the question but the cost of fuel is extremely important. The petrol bill of Australia has doubled in the last four years and the prices which have to be paid for petrol vary from about 2s per gallon at the port to 3s 6d and 5s 6d in the back country according to the distance. The paper stresses this question of fuel so fully and Mr Ormsby Gore has already dealt with it that I do not propose to go into it further now than to say that the Development and Migration Commission have appointed a Committee on Mechanical Transport and as they consider it very important have already made arrangements thoroughly to test the producer gas types of vehicle in Australia.

One other point I should like to stress is that if motor transport is to develop as we hope and as I suppose we really know it will ultimately do in Australia it is quite essential that it should be a development on such a scale as to enable large loads of staple products to be carried at cheaper rates than are now possible with the present horse transport. Horse transportation in Australia now varies in cost from 10d to 1s 6d per ton mile. I believe it is improbable that horse haulage in our outback regions can be very greatly reduced in cost. I understand that in 1918 the United States Department of Agriculture issued figures showing that while horse haulage for wheat and cotton cost 1s 3d and 2s per ton mile respectively motor haulage cost for the same commodities 7½d and 9d per ton mile respectively. This fact appears to my mind to explain the very extensive replacement of the horse by the motor lorry in American rural transport. It would be extremely useful if, during the discussion some

of the American delegates would give us further information on this point Of course in America reasonably cheap fuel is available but I think in general the problems that we would particularly like to know about are to what extent is the six wheeler going really to become an economical and successful method of acting as a feeder to the railways will it be necessary to use the track vehicle in order to deal with extremely difficult and wet conditions and is the road train really an effective proposition as a feeder to railways where the quantity of produce to be handled can justify it?

Mr T S HAITENBERGER (Hungarian State Railway Motor
T prepared on the Organisation
Road Services in connection
iave in my paper (see Section
) in Hungary The Motor
ian Railways which I represent is operating inter city bus routes and long distance goods transportation service The natural consequence of the development of the road transport industry was a co ordination between the railways not only in passenger but in commercial goods transportation In Hungary almost completely an agricultural State this co operation as seen by the annual statistics of the Hungarian railways has thoroughly justified itself In the different areas we are increasing from day to day the number of buses and lorries which on account of comparatively cheaper operating costs with necessarily cheaper fares with their flexibility and rapidity afford a better service with more comfort to the public than extending railways in the less populated districts Even on the lines run by the railways the traffic in these outlying areas has gradually fallen away owing to the necessity for passengers to change several times in order to get to their final destination

It was in view of these conditions that the idea arose for using road vehicles to feed the main railway lines The Company was formed last year after careful study and organisation and began by running vehicles on certain lines A programme for furnishing the whole country with similar road transport services has been mapped out which it is expected will be complete in two or three years and the results are regarded with the greatest optimism This increase of road traffic of course demands good roads and the rebuilding of many of the roads is now in progress There is every hope that when the programme which has been prepared is complete the roads of our small country will be in such condition everywhere that the Company in conjunction with the railways will be able to serve the common interests of the public in all respects

M REGNAULT (Administrator General Secretary of the Société des Voyages et Hotels Nord Africains) submitted a paper on "Motor Transport in French Northern Africa" (see Section II), and his secretary submitted the following further notes on his

behalf French Northern Africa the territories of which extend to the Southern confines of Morocco and Tunisia is a land where from the point of view of transportation the motor car is undisputed King In Algeria for many years past motor traction has been extensively used particularly by agricultural settlers It is mainly the years succeeding the great war that have witnessed an intense development in the use of the motor car throughout the whole of Morocco as well as in Algeria and Tunisia This progress has been of altogether undreamed of proportions The making of extensive and elaborate touring arrangements has not been one of the least factors in this development but contemporaneously with the great flow of motor tourists from all parts of the world the native population of Morocco, Algeria and Tunisia has shown a remarkable tendency to adopt motor traction This penchant has resulted in big capacity cars of high speed being put into general use on the roads right from the start the native element has taken enthusiastically to these vehicles and the development of the public services has gone from strength to strength It may be said that the early part of the year 1920 saw the first really great strides in the development of motor transportation in these lands Each successive year North Africa has absorbed the latest models both of large vehicles for public conveyance and of private touring cars This applies both to types of engines and to body work All this progress has taken place simultaneously with the construction of the railroad system of Morocco and the extension southwards of that of Algeria

If this development of motor transportation has not harmed the progress of the railways the same thing cannot be said of that once exclusive means of Saharan transportation the camel—' The Ship of the Desert The various exploration missions have made full use of the new 6 wheel motor vehicles as well as of [illegible]

The effect has been that steadily and particularly since 1924 each year has seen these vehicles employed, to the displacement of the former means of travel—the camel Mention must be made of [illegible]

[illegible] disappeared

I would like in closing to give you a few figures with regard to the number of motor vehicles in use in French Northern Africa In Morocco at the end of 1921 there were 2 441 private cars and 1 052 commercial vehicles At the end of 1923 there were 3 595 private cars and 1 632 commercial vehicles At the end of 1925

private cars amounted to 6 025 and commercial vehicles to 2 293 At the end of September this year there were 9 329 private cars and 3 318 commercial vehicles an increase of 400 per cent in four years The figures for Algeria are 1914 1 345 private cars and 92 commercial vehicles in 1923 3 735 and 226 and at the end of September 1927 4 561 and 542 respectively an increase in private cars and commercial vehicles combined of over 400 per cent In Tunisia in 1914 there were 975 motor vehicles of all descriptions at the end of 1923 this number had increased to 2 600 and at the beginning of 1927 it was 6 703 cars an increase of roughly between from 600 and 700 per cent

Mr W E Hogg (Deputy Chief Inspecting Engineer to the Crown Agents) presenting the memorandum by the High Commissioner for Palestine on Road Transport Conditions in Palestine (see Section II) said In the Memorandum which has been prepared by the High Commissioner for Palestine the motor transport conditions in Palestine are not dealt with particularly in relation to the Development of World Resources which is the special subject for consideration at this meeting but are set forth briefly under the several headings corresponding to the various subjects which have been arranged for discussion by this Congress The report shows that rapid growth in the use of mechanical transport has recently taken place in Palestine In July 1924 the total number of motor vehicles in the country was only 891 By the end of 1926 the number had risen to 2 306 Thus in less than 2½ years an increase of 250 per cent had taken place Though the actual number of vehicles is still very small in relation to the size and population of the country the rapidity with which the use of motor vehicles is growing indicates that the country is alive to the advantages of this form of transport Moreover the Government is doing everything possible to encourage such enterprise by improving the roads so as to render them more suitable for the new kind of traffic The growth of suburbs or large towns such as Jerusalem Jaffa Tel Aviv and Haifa has resulted in the installation of local motor bus services

In Palestine as in many other countries there is an increasing tendency for motor transport services to compete rather than co operate with the railways and the transport of oranges is now largely undertaken by motor lorries which convey the fruit direct from the groves to the quay Mechanical transport vehicles of the rigid 6 wheel type have not yet been tried in Palestine and though their usefulness for military purposes is apparently recognised it does not seem to be realised that this type of vehicle possesses advantages over the ordinary 4 wheel type for use on roads of light construction principally by virtue of the fact that greater individual paying loads can be carried without a proportionate increase in axle load This of course is due to the provision of an extra axle Several other advantages are claimed for the rigid 6 wheeler even in regard to its use on the best classes of roads but these will doubtless be fully discussed when the

merits of these vehicles are more particularly considered at another meeting of this Congress

Let us now leave the consideration of the development of Palestine for that of the world generally. As everyone is aware motor transport has now become an indispensable adjunct of modern civilisation. It has already done much to develop the

naturally think of its potentialities in opening up to trade those vast tracts of undeveloped land which are situated in various parts of the earth, and which are at present deficient in roads and other means of internal communication. Several of the British Dependencies in Africa may be included in this category. In these territories motor transport was utilised only to a very limited extent until shortly after the war. Up till that time practically the only motor lorries available were of 2 tons or upwards capacity and these were invariably equipped with solid rubber tyres. Such vehicles were quite unsuitable for the majority of the existing roads and as the construction of roads suitable for the vehicles was entirely beyond consideration on account of the prohibitive cost little progress could be made in extending the use of motor transport. However a remarkable revival in the use of motor transport followed the introduction of giant pneumatic tyres and lighter vehicles of from 1 ton to 30 cwt capacity which were better adapted to operate over primitive roads than the heavier types of lorry. Motor transport now began to be a really important factor in world development. The chief credit for this remarkable advance is due to the tyre manufacturer who first produced pneumatic tyres possessing load carrying capacities and reliability comparable with those of solid rubber tyres.

Unfortunately experience has shown that even the 30 cwt pneumatic tyred lorry is still too destructive of lightly constructed roads to be regarded as entirely satisfactory.

Consequently in several of our Colonies it has been necessary to introduce legislation for the limitation of axle loads and speeds. In some cases it has been made compulsory that vehicles must be equipped with reliable and untamperable engine governors in order that speed control shall be automatic. These restrictions are rigidly enforced. Everywhere road constructions and improvements are being carried out to such an extent as is possible with the proportion of revenue available for these purposes but road users are never satisfied. Road makers and road users are always at variance. Their primary interests are in direct opposition. On one side the road makers invariably the local government faced with the problem of spending a limited revenue to the best advantage are obliged to exercise reasonable economy in the cost of road maintenance and construction, on the other side the road user demands better and

more substantial roads and freedom from vexatious restrictions on axle weight and speed in order that he may increase trade by the employment of larger and speedier vehicles To undertake the immediate installation of a system of first class roads would involve an intolerable burden of taxation which local industry could not afford to bear It would appear that the construction and improvement of roads must take place gradually and in proportion to the degree of development of trade

What is greatly needed in undeveloped countries is the ideal motor lorry which is equally suitable for operating on roads or across country and which would possess the rare virtue of tending to consolidate and improve rather than deteriorate the surface over which it runs Metalled roads might then perhaps be dispensed with The recent introduction of rigid 6 wheel lorries and those fitted with creeping tracks represents a step towards this achievement But to what extent is it ever likely to be practicable to dispense with proper roads? To suppose that it will ever be convenient to be without roads of some sort is inconceivable Proper roads must exist in towns and though it may not always be necessary that these roads should be of substantial construction yet it is desirable that their surfaces should be rendered waterproof With regard to country roads if these are to be used by private cars and omnibuses in addition to goods transport the public demand for reasonable comfort in travelling will at least necessitate the maintenance of a smooth and even road surface

even if motor vehicles ever attain such perfection in design that their destructive effect on roads is negligible the road maker will still have to contend with the devastating effects of weather

It would therefore appear that however highly developed the cross country type of motor vehicle may become commercial transport will always require roads of some kind An extreme degree of cross country performance though desirable in vehicles intended for military use is unnecessary in vehicles intended purely for commerce and for use almost entirely on roads A moderate degree of cross country performance however will be always desirable in vehicles required for use in undeveloped lands since apart from its value in facilitating operation over bad roads many instances must occur where the development of trade by means of some form of cross country transport must necessarily precede the construction of roads

Mr R H Brackenbury (Empire Marketing Board) The world resources in which the Empire Marketing Board is most interested are those vast reservoirs of wealth at present lying dormant in the undeveloped or partly developed portions of the Dominions and the Colonies I cannot do better than start off with the general proposition that not only the physical but also the economic conditions of our Empire overseas vary to

larger extent than those of this country with the natural consequence that a much greater variety of transport methods is required to meet them Alexandria Cape Town Sydney Bombay—all present urban traffic problems which except for details are substantially the same as those of this country but the deserts of the Sudan the plains of Australia and the forests of tropical Africa offer novel conditions with which the motor manufacturer in the Midlands has not been called upon to deal or at any rate not with that same vital intensity which he devotes to his primary concern—the home market There is no duplicate in this country of these vast semi developed sparsely populated regions with which I am now dealing

There are two outstanding characteristics in the transport problem of these areas which differentiate them from those of England In the first place whilst it may be said that arterial railways pay on the whole it is now generally agreed that branch or spur lines are uneconomic because the volume of traffic coming down over their long distances through thinly inhabited country is usually insufficient to pay interest on the high capital cost That is one characteristic Another consideration is this there is a kind of economic gap in the cost of railway transport as compared with the cost of any other kind of mechanical or animal transport A railway working to capacity can carry produce for a penny or two per ton mile The motor lorry charges a shilling or two for the same service—12 or 15 times as much The result is that while the railway has an economic radius of hundreds of miles the motor lorry is limited to tens of miles I feel sure that it is in the bridging of this economic gap the solution of the transport problem of the Empire is to be sought I do not think that the perfection of a motor vehicle to meet this need will supersede existing methods of transport On the contrary I think it will supplement them and stimulate their increased use by linking up with the railways fertile districts at present lying fallow The ideal we are seeking is this the perfection of a long distance feeder to the arterial railways in these semi developed countries the provision of a feeder which by carrying transport at 3d or 4d per ton mile will have an economic radius of 150 to 200 miles It is along these lines and with these ideas in mind that the Transport Committee of the Empire Cotton Growing Corporation of which I am a member has been working We are convinced that the construction of a motor transport unit to meet this need is a perfectly practicable feasible proposition and we believe further that its perfection will do more to develop the resources of the Empire and make them available to the rest of the world than any other single factor that we can think of

The morning session then closed

The delegates were subsequently entertained at luncheon and were received by Sir George Beharrell, D S O , and by the Rt Hon Sir William Joynson Hicks, Bart , M P (Secretary of State for Home Affairs), on behalf of the British Government After the Toast of " The King, as well as the Toast of the President of the Congress H R H The Prince of Wales, had duly been honoured,

The CHAIRMAN (Sir George Beharrell) said We are honoured to day with the presence of one of the Members of His Majesty's Government Sir William Joynson Hicks, the Secretary of State for Home Affairs Sir William has peculiar claims to address you at the first of our series of luncheons this week Not only is he Home Secretary, whose interests are so largely wrapped up ... insport, but he is known ... of motorists He stood ... lays, in its darkest hour and every motorist has reason to congratulate and thank Sir William for the efforts he made in the early days on behalf of motorists The procession of old time motor cars *to Brighton which took place yesterday served to remind many of* us of those early struggles and the faith and enthusiasm of those pioneers of motoring to whom we to day owe so much

SIR WILLIAM JOYNSON HICKS I have the very great pleasure as a Member of His Majesty's Government, to express our welcome to you here to day You have come from all parts of the known world, and you have done us the honour of meeting in our capital City of Great Britain You have come here in order to place all your knowledge and all your thoughts at the disposal of one another in order that civilisation which, it is a truism to say is founded on transport, should be increased throughout the world I suppose when one reads the history of the world during the last few centuries no one can gainsay that roads have always been the forerunners of civilisation and the forerunners of trans port I have sitting on my right a representative of the Kingdom of Italy, but I need not go back so far into history to the days of the ancient Romans who were indeed noted above all else for their determination to found Roman civilisation upon Roman roads They were right If all other nations of the world, after the Roman civilisation had more or less died out, had determined to copy them in that respect the world would have been civilised very much sooner than it was In my own country of England we had the inestimable advantage of Roman roads, but our ancestors were foolish enough to allow these roads to disappear They were lost for many centuries, but to day some of them have been unearthed, and to day they represent the straightest method of getting from one part of England to another, and we find the old foundations of Roman roads still intact and still serviceable for traffic The world owes a great deal to ancient Rome as it

owes a great deal to modern Italy by being the first country to construct those great "autostrada" motor roads of which we have heard so much.

I want, if you will, to consider for a moment how thoroughly civilisation retreated when roads disappeared. Those of you who *have read the history of my own country—and the history of all* Central Europe was the same—know perfectly well that all through the M... ...nds Bunyan in his Pilg... ...of Despond that was the ... Middle Ages. There was no ... e was hardly a decent road that could carry wheeled traffic. The rich man rode, the judge rode, the bishop rode, the officer rode, and the poor man and the poor woman went through mud, in many cases well over their knees. Civilisation was impossible, manufactures were impossible, agriculture was almost impossible. It was in a very poor state indeed when you consider that even 300 to 400 years ago, when we were beginning to think we were civilised, corn had to be carted to the market on horse back, food had to be carried in panniers on horse back, and manure was generally carried up to the fields on the backs of women. There was no real civilisation in the good old times of which many of our novelists write, and many of us think were so wonderful.

Many of you have been to Scotland, and it may interest you to know that it is not 200 years since there were practically no roads in the Scottish Highlands. Then the Government decided to civilise the North of Scotland, and they proceeded to do it by roads. In less than 20 years the Government built in the North of Scotland 900 miles of new road and 1,200 new bridges. There is an example for the Minister of Transport! There is an example for the better application of the Road Fund of to-day, and it really was a beginning of real civilisation, civilisation not for the rich, but for the mass, for the poor, for the agriculturist, for the land worker, and for the man who in Scotland in those days—you can find it all recorded in our histories—had never learned the use of a tool, but became excellent labourers by working on these new roads under the great road engineers of those days. Particularly under the road engineer whose name is a household name now, Telford, the people learned to use tools, and so learned to civilise themselves by learning to work. Surely there could be no higher object in this world that that of improving the civilisation of the masses of the people, and if you come down to to-day, what have you gentlemen not done for your own countries. What has not the motor engineer done for the extension of civilisation in every country in Europe, because civilisation means happiness, contentment, better work, better workers for your manufactures, and better markets in the towns for the products of agriculture. All these things are the result of the last 25 years work of the motor engineer in developing new forms of mechanical

traction and in developing roads extending into all parts of the country bringing the life of the town into touch with the life of the country village and bringing the villager into touch with the greater educational facilities and activities of the town

You are here to day to consider in this great Congress the question of the improvement of roads the development of new road surfaces the development and improvement of every kind of means of communication and I say to you quite definitely that I know of no agency which is causing so much good so much happiness and so much prosperity to the nations of the world as the development of roads and the development of transport both commercially and otherwise upon them There is no doubt whatever that upon roads commerce and industry are built up and will continue to be built up but there is something even more than that We sit here to day round these tables and all of us have a memory hanging over us of the troubles of 1914 to 1918 Side by side to day in peaceful contentment are representatives of those countries which ten years ago were fighting one against the other Here to day they sit together here they confer not for any selfish purpose but for the good of the whole world each putting into the common stock his own ability his own knowledge and his own thoughts to improve the civilisation of the world The greatest object of civilisation is the peace of the world The greatest means of attaining peace is that men should know each other that there should be close inter communication between all the countries of the world bringing the ancient enemy to know intimately his ancient enemy for when nations know one another when men and women are individually friends with one another then the nations become no longer enemies but peaceful allies The peace of the world depends as I said a few minutes ago civilisation does upon the outcome of your great Congress If you can only continue the work that has been done by the road engineers and continue the development of communication man to man and country to country you have laid the foundations secure and strong not merely of extended commerce not merely of greater civilisation but of centuries of peace throughout Europe and the world I stand here as a Minister of His Majesty s Government to repeat to you our welcome not merely because of the immediate object of your Congress which is valuable and will conduce to the welfare of the nations but because we believe as a nation and as men responsible for the Government of our nation that the world needs peace We believe that there is a demand for peace We believe there is a movement for peace spreading throughout all the nations of the world and I say to you that I believe—and it is because I believe it that I am here to day—that in your hands lies the power of increasing that movement in favour of peace and bringing greater knowledge and greater friendship to bear between the nations of the world May I say to you God bless you in the great work you have undertaken

SECOND SESSION *of the*

World Motor Transport Congress

HELD AT

THE SAVOY HOTEL, LONDON, W.C.1,

ON

Monday, November 14th, 1927.

THE HON SIR ARTHUR STANLEY, G.B.E.
(Chairman of the Royal Automobile Club and of the Imperial Motor Transport Council)
in the Chair

Subject of Discussion: "Road Construction and Improvement in Relation to the Development, Efficiency and Economy of Road Transport."

The CHAIRMAN The subject for discussion this afternoon is "Road Construction and Improvement in Relation to the Development, Efficiency and Economy of Road Transport,' and I will call upon Major R A B Smith to present his paper

Major R A B SMITH A C G I (a delegate of the Commercial Motor Users Association) As it will be impossible for me to condense my paper (see Section II) in the short time available all I can hope is that a few of the points in the paper will be of use to you, and I will do my best to answer any questions you may raise upon it There are probably many more important points than those I have mentioned in the paper, but those I have put forward for discussion will, I hope, be regarded as of some importance The personal element is bound to come in any paper of this nature, but the whole question of road construction and improvement is such a huge one that it is impossible to deal

with it on one basis I have tried to deal with the matter generally as I have seen it in this country and abroad and trying to deal with it in that way I have realised the magnitude of the task If therefore you will kindly put your queries I will try if possible to answer them this afternoon but if they are too difficult I shall have to think them over and answer them at some future time

Lieut Col C H BRESSEY C B E (Chief Engineer Ministry of Transport) Speaking as a humble representative of the Ministry of Transport allow me to say how gladly we welcome this opportunity of meeting our colleagues from overseas several of whom have done us the honour of calling at the Ministry s Offices during the past few days It is well for all of us to realise how small a fraction of the world s transport problem falls within his pers[illegible] cter of the subject [illegible] to one by a glance [illegible] pulation of 320 000 000 is shown to have a road system totalling 216 000 miles in length partly metalled partly unmetalled i e one mile of road for 1 481 inhabitants Compare this with the little island of England Scotland Wales with its metalled road system of about 180 000 miles serving a population of 43 000 000 i e one mile for 238 inhabitants—a more than sixfold difference as compared with India From another standpoint India would appear to have about one mile of road to eight square miles of terri [illegible] ile of road [illegible] uth Africa shows us again a country of huge distances where the rural areas as in India are largely dependent upon earth roads which are liable to become almost impassable to wheel traffic during the rainy season We in England have of course passed through a precisely similar stage In the second half of the 17th century when Charles II was King an Act was passed limiting to 20 cwt the load that might be carried on any wagon between October 1st and May 1st This measure for the protection of weak roads being found ineffective an Act was passed in the middle of the 18th century requiring all carts and wagons using turnpike roads to have tyres at least 9 inches wide

The transformation that has been wrought in England since those days will be gradually achieved in the less developed countries and one may perhaps hope that experience already gained here may save our kinsmen in the Colonies and dependencies from some of the mistakes committed at home As a vivid instance of the effect of road construction upon road transport it will be observed that the boundless multiplication of light cars in England is doubtless due to the presence of a highly finished road system while both in India and South Africa the more rudimentary earth road will doubtless open a wide field of activity for six wheelers When considering the transformation

of roads which has taken place in England during the past quarter of a century it is well to remember that we have no national highways here and that it is the local authorities of the country who with assistance from the Government Road Fund have faced the task of converting water bound carriage drives into commodious motor tracks adapted to every vagary of the climate To some of our urban roads one might almost apply the term armour plated It will therefore hardly be denied that road makers have gone very far and at very considerable cost to meet the needs of the motorist

One of the disadvantages attaching to a hard smooth impervious surface which offers the easiest and most economical running for motor vehicles is that in some states of the weather there is a risk of skidding In Major Smith s paper I notice a tendency to place the entire responsibility for this on the highway authorities or road makers The matter cannot be dismissed quite so simply and summarily The design of the vehicle is a very material factor We all know that some vehicles hold the road better than others In Sir William Hov s paper one particular type of vehicle is described as minimising the risk of skidding While so many of the ablest members of the world s motor industry are in consultation is it too much to hope that vehicle designers and tyre manufacturers will collaborate ungrudgingly with road engineers in grappling with this important problem? Road makers alone can do much in collaboration with the skilled technical advisers of the motor industry they can do more

Mr W Rees Jeffreys (Chairman Roads Improvement Association) Everybody will agree as to the important part that roads play in the development of a country and in the establishment of peace as well as in commercial and industrial prosperity It is a lesson that we have been slow to learn but we are now learning it It is to be hoped that as the result of this Congress a f ... ent of roads not only i ... world and that with t ... l I remember when President Wilson years ago talked about the freedom of the seas I drafted a memorandum on the freedom of the roads and by the freedom of the roads I visualised the time when I could land my car at Boulogne or Ostend and drive into Asia unobstructed by any Customs barriers When we get the United States of Europe then Europe will rival in prosperity the United States of America There one can land a car in New York and drive it across independent States thousands of miles from New York to San Francisco unobstructed by any Customs barrier Therefore I say that in the construction of roads and in the freedom of roads lies the greatest hope as the Home Secretary said at luncheon to-day not only of peace but of progress

The road and the problem of the road is so full of interesting points that it is very difficult to deal with more than one or two of them in a short speech We in England have made a big stride since the war in the development and improvement of roads But now there is quite a gap there has been a break in that development Col Bressey spoke just now as the representative of a doomed Department—(A voice No no)—the Ministry of Transport is to be swept away In the interests of economy and the balancing of our Budget £26 000 000 of the money we had set aside and ear marked for roads has been appropriated elsewhere I have regretted that circumstances have made it necessary for that to happen It is unfortunate that to day when we are spending I believe something like 13s or 14s out of every £ of our national income in paying post war debts and preparing for future wars the small sum that is needed for improving our road system and which would assist to create wealth has had to be cut down I think that one of the things we have to attempt to deal with in this Congress seriously is how we are to make good in some form or another the delay in the development of our road programme which has been caused by this abstraction of £26 000 000

This movement for new roads and their development in order to provide for the growing motor industry is very serious not only from the point of view of the country itself but of industry generally and of the motor industry in particular We are turning out motor cars in this country every year faster than we are *providing roads to accommodate them and unless we provide* the roads for these cars it will react upon the motor industry itself The Kingston by pass was opened the other day, and, already the Chairman of the Surrey County Council has declared that it is over crowded The programme of road development in this country has been held up in several directions The progress with the Western Avenue which is very urgently required to relieve the traffic upon the Oxford road through Acton Hanwell and Uxbridge which we thought was going to be built and opened by now was arrested two years ago when the Treasury found they could not release the money necessary to complete the Avenue part of which has been constructed Therefore this question of roads like all other questions is fundamentally a financial matter In this country as I am afraid it is in France and other countries the question is how to find the funds necessary to carry out this development programme which is essential in the interests of peace and commercial prosperity

I have been asked to say what is my vision of the roads of the future We have gone along so far on conventional lines In Italy however—and I am glad to know the Italian delegates are here to day—they have developed along somewhat different lines They have built as you know autostrada ' which are reserved entirely for motor traffic and which are cut off from the

rest of the country in the same way that the railways are cut off from the rest of the country The severance is complete Now is that the line of development that we are going to take in this country? We have to provide new roads for the increasing number of people in this country who are determined to use motor vehicles Are we to proceed along the lines that we are going at present or are we to proceed along the lines that the Italians have suggested to us and which at the International Congress last year in Milan was approved in principle by the rest of the European countries or is there some via media between the two which offers greater practicability in a country like this? Of course one cannot lay down in the matter of road development any law or any practice which can be adopted everywhere Mr Churchill when he was defending in the House of Commons his abstraction of the £26 000 000 to which I have referred said that at any rate the roads of Great Britain are the best in the world There is no country with one possible exception with which we can compare Great Britain in the matter of roads Great Britain is an industrial country with a big population in a very small area and the only country with which it would be possible to compare it in the matter of roads would be Belgium It is impossible to compare it with say France which is mainly an agricultural country and yet France still possesses a road system which is in many respects better than ours Therefore it is not wise to institute comparisons unless you are quite sure that the comparison is a fair one

How in this country are we to develop roads in the future? Personally I see the time coming when we shall have to build roads reserved entirely for motor traffic One of our difficulties to day is the mix up of traffic travelling at varying speeds Then also we are building very expensive roads much of the space of which is taken up by stationary traffic I doubt whether it is wise to spend 14s or 15s per square yard to build roads a considerable part of which is occupied throughout the day with stationary traffic Nor is it wise to build 30 ft roads such as the Kingston by pass for example which in the main by reason of the stationary traffic and by reason of the fact that traffic in England does not keep to its near or proper side is in fact little more than a two track road This it seems to me is a waste of funds Therefore my idea of the road of the future which is to combine efficiency and economy for road transport is in part a speedway reserved first of all entirely for high speed vehicles and secondly that on such a road no stationary traffic will be permitted It will be illegal by regulation for any vehicle to come to rest or stand still on that road which will be a speedway pure and simple

Personally I would here depart from the Italian principle which has adopted the idea of severance Severance I think is to be regretted We know in this country of the meaning of

severance in connection with railway development and how important tracts of country are separated by a railway line and how costly it is to join them up once more by bridges or by tunnels Therefore in my conception it is a speedway something on the Italian pattern but not severed from the rest of the country and which will be confined to fast traffic no stationary vehicles being permitted This idea will not of course arrest development alongside that road because houses or factories adjacent to it will require their own private roadways leading off the main speedway to these premises where they can pick up and put down as they wish We could build such a speedway for instance from the Sutton by pass and the Kingston by pass going to Brighton to join with the projected new road at the back of that town and this could be continued along the south coast past Southampton and on to Bournemouth I give you that as a typical example of a road that I think under ordinary conditions can be built and wisely built and would be a legitimate development of the roads in this country

It seems to me that we can in a Congress of this kind get a vision of what we are striving for and what is our idea of the next step in the development of roads in this and other countries I feel I have only incompletely sketched my idea of the next development of roads in this country You will at once ask how is it all to be paid for? In Italy they paid for their autostrade by tolls However I do not think tolls would ever be welcome again in this country Tolls are an anachronism They are unsound economically and we are pleased that the Ministry of Transport are doing their best to abolish the tolls that still remain Sir Henry Maybury the other day was present at the opening of the Gainsborough Bridge which is being bought out as a toll bridge and the tolls on it will be abolished I do not think tolls are a sound system or will be adopted in this country although they have been adopted in Italy There is a second reason in this country why we shall not welcome tolls Motorists are paying a very heavy annual tax on their cars and the produce of that tax is quite sufficient if properly applied under a sound financial system not only to improve all the existing roads but also to provide these additional speedways which I think the development of automobilism demands No less a financial authority than my friend Sir Edgar Harper who has recently retired from his important position on the Board of Inland Revenue holds the view that the Road Fund is not the proceeds of taxation regarded in the ordinary way but is the proceeds of money to provide machinery by which the owners of motor vehicles should be provided with roads for their benefit If that is a correct definition of the Road Fund I think that the owners of motor cars should have the right to say that they will have a portion of this money spent in building speedways where they are required for the use of motor vehicles only as they h

been built in Italy Such speedways seem to me to present a future and open out possibilities for the development of motor traffic in this country, and possibly in other countries, the end of which it is not given to any of us to foresee

His Excellency Senatore CRESPI (President, Royal Automobile Club of Italy) The Home Secretary in his wonderful speech at luncheon to day referred to the ancient Roman roads and the new roads which modern Italy is constructing, and Mr Rees Jeffreys has just made a comparison between the "autostrade" in Italy and the new roads which are being built in England The position in Italy to day is that the Italian Government is undertaking the renewal of most of the ancient roads of Rome and many others in different parts of Italy We are reconstructing these roads, and if, as I hope this Congress is held in Italy next year, you will have an opportunity of seeing what we are doing (Senatore Crespi at this point indicated by means of a map the exact location of many of the roads to which he referred)

Continuing, he said The Italian Government has prepared an extensive programme of road reconstruction in Italy It is true we have constructed some special roads for automobiles, which we call 'autostrada, but our conception of the autostrada is that it has a special object quite distinct from that of the ordinary roads of the country We have constructed and shall continue to construct new autostrade, specially between Italy and the other countries bordering on it where the traffic is very large and where the ordinary roads pass through villages and towns and render any speed impossible if the traffic is kept to these ordinary roads That is the object of constructing the autostrade As has already been pointed out, the real problem is the financial one but the practice in Italy is to make the traffic pay for the construction of these roads For instance, on the autostrada from Milan into Lombardy the traffic is very dense and the tolls charged will quickly pay for the cost of construction The autostrade in the neighbourhood of Milan have been built by a private company the Government assisting by a guarantee of the bonds which were issued in the name of the private company Thus it is with private money that the autostrade have been constructed The cost of these roads is about one million lira per kilometre, or £10,000 to £12,000 at the current rate of exchange For Italy, of course, this is a big expenditure We have now built three autostrade between Milan and the three lakes, *Maggiore, Como and Varese, and a month ago we opened* a new autostrada between Milan and Bergamo, which is also an industrial town Experience has shown that in a very short time the revenue from the traffic on these roads pays the interest on the capital expenditure The present scheme is that the roads are built by a private company which charges a toll according to the nature of the vehicle using the road, but the Government has the right at any time to take over

these roads and I hope that the returns obtained will continue to grow so that there will be a big inducement for the Government to take the roads over and abolish the tolls

The example which Italy has given however is quite a special method adapted to the special conditions of a country where the roads are few The intention is to build other roads of a similar character in other parts of Italy where the conditions are similar to those in Lombardy which I think is the most populated region of Europe We are now building another autostrada between Naples Pompeii and Salerno In the ordinary way we have a traffic between Naples and Pompeii of about 150 000 tourists per annum It is a big traffic which has to be met by the use of motor cars The surface of the existing roads is very bad and it is really a torture to go by car between Naples and Pompeii where everybody wants to go because they can see a Roman town in its old condition Therefore an autostrada needs to be constructed between these two places very quickly As a matter of fact we were able to construct the autostrade from Milan to three lakes a distance of 80 kilometres (50 miles) in twelve months

With regard to the general problem of roads in Italy we are undertaking a scheme for the improvement of the existing roads in all parts of the country but of course the traffic will not be able to proceed along these reconstructed roads as quickly as it can travel on the autostrade As an indication of what is done on the autostrade I may mention that my factory near Milan is 35 kilometres (about 22 miles) from the town entrance and I do the journey every day in 24 minutes which is a good average speed Of course we cannot think of such speeds on the ordinary roads but it is hoped that the improvement in them will enable the traffic to move more quickly Again the improvement of the existing roads is of course purely a financial question although it is also a technical one Our Government has carried out an investigation as to how this improvement shall take place and it is hoped that within the next week or so Signor Mussolini will decide upon a programme of works dealing with 13 000 kilometres (8 125 miles) of roads as a beginning

Eventually the programme provides that the whole country will be served by a network of good roads For the most part these existing roads are the ancient roads and they will be put into modern condition with modern materials Mostly tar macadam will be used but we shall also make considerable use of concrete It is believed that this is the best non skid material, judging by the experience of motor racing on the track at Monza where we can reach speeds of 200 to 250 kilometres (125 to 155 miles) per hour without danger even on the corners The autostrade are also constructed of concrete This however is very expensive and therefore I think tarred macadam or macadam treated with bitumen will be used on a large portion of the reconstructed existing roads The expenditure on the roads of course

will vary in different parts of Italy according to the conditions Great progress is being made already in the road conditions, and if those of you who happened to be in Italy in recent years would come there now, you would find a great change Nearly all the highways in the province of Milan for instance, are now very modern, being covered with asphalt which gives a good road
[illegible] it inconvenience
[illegible] n to the vehicles
[illegible] of Venice great
[illegible] id many roads
throughout Italy are now in a very good state The road across the famous Dolomites and on to Bologna and others have been renewed The Sicilian roads have also been renewed at an expenditure of 100 000,000 lire

(At this point Senatore Crespi produced a diagram showing how the expenditure on road improvement has been provisionally allocated in Italy)

Continuing with regard to the financial programme he said I do not consider the financial problem of the construction of roads a really difficult one and I am able to give you some figures which we have calculated The general expenditure on the 13 000 kilometres of ordinary roads which I have previously referred to we shall spread over five years and it will amount to 2¼ milliard lire The financial problem is this we want to hand over to the Government taxation in the provinces for road purposes and this represents about 40 per cent of the taxation on motor vehicles In Italy the Royal Automobile Club takes all the money from motor taxation—(laughter)—because the Royal Automobile Club in Italy is a branch of the Government The President of the Automobile Club in Italy is not elected in the ordinary way but is nominated by the Duce and the President of the Club has the duty to nominate all the Presidents of the provincial automobile clubs Therefore, the Automobile Club of Italy is closely connected with this work of reconstructing and improving the roads

The older roads in Italy represent about 140 000 kilometres (87,500 miles) and 7 000 kilometres (about 4 400 miles) of new roads were reconstructed during the war In addition to using 40 per cent of the income from taxation upon road reconstruction and improvement, there will be a small tax upon vehicles, say 10 lire, or 2s per annum which will give us a further income of 80 to 100 million lire and thus we shall be able to finance the improvement of the roads without taking a single centime from the taxation which the Government levies for the general needs of the country We anticipate spending from 120 to 140 million lire in the first year to finance the total expenditure of 2¼ milliards Thus, if the financial problem is handled in this manner, it will be seen that it is not a very difficult one, and if Italy can work on these lines, other richer countries ought to be able to solve this road problem even more quickly We are getting

to work on the problem in Italy and are convinced that it is only by very hard work in all directions that we are going to make our country glorious in the future as it has been in the past centuries. Our endeavour is to bring Italy to a high state of perfection and to give to the world an example of a nation which only desires to work for the benefit of its own population and for the increase of its prosperity in the first place, and, of course, incidentally, for the progress of civilisation as a whole.

GEHEIMER REGIERUNGSRAT PFLUG (German Ministry of Transport ...
new ...
way ...
cial, technical and administrative points of view. As concerns the technics, the most important thing for a country like Germany ... loped, is to adapt ... t modern traffic, th... connection it h... ich horse traffic. Traffic registrations made in Germany have proved that about half of the highway traffic in tons consists of horse drawn vehicles. Although Germany has a total of 700,000 motor vehicles, the number of horses has not only not decreased—in comparison with former times—but has even slightly increased.

In order to find the best and most economical method of adapting the existing roads to the modern traffic a co operation between the road building administrations with the technical high schools is of special importance. At each technical high school in Germany an institute for road building experiments has been arranged, which is intended to co operate with the neighboured road-building authorities. In considering the relations between motor traffic and road construction we must not forget that the motor vehicle is preponderatingly a near-distance means of traffic. In this relation it is the most universal vehicle, being neither bound to rails nor to waterways or canals. In regard to long distance traffic the motor vehicle has indeed a certain importance for so called pleasure and excursion traffic and for the transport of valuable and perishable goods, but it cannot measure itself in this regard with the railway. The motor vehicle ... distance means of traffic and ... vement and flexibility, we ... ily to be provided for a widespread network of highways in order to promote motor traffic.

The creation of such a widespread highway network is more important for motor traffic than the construction of long distance roads only intended for motor vehicles. Such roads are to be considered for countries with less develo... affic only in exceptional cases, ... towns to be by passed. The ... the opinion that there must be ... in the near future, in connection with the enlargement of the existing highways, the

requirements of long distance motor traffic and that the provision of funds for this important task must in no case be hampered by projects of roads exclusively serving motor traffic. The Ministry of Transport has therefore left out of consideration the project of constructing a new road as for example from Hamburg via Frankfort am Main to Basel for the exclusive use of motor vehicles. This project is promoted by local authorities and private associations. At present the Ministry of Transport can only acknowledge the right of dealing with such projects in so far as it is desired to give certain leading directions for future guidance in road building schemes.

As to financial matters I may say that in Germany about the same taxes are imposed on the different kinds of motor vehicles as in England. Equally it is stipulated by law that the revenue from motor taxation shall be used for road maintenance. Motor traffic still being in its infancy only a third of the costs of highway maintenance can in this way at present be furnished. The remaining two thirds must be taken from general taxes. This share will certainly diminish in future with the increase of motor traffic which is surely to be expected. The costs for new roads and for road reconstruction work which practically means new construction will have to be covered by loans.

As regards road administration the object to be aimed at is the classification of the roads leaving the administration of the most important traffic routes in the hands of the already existing great and capable authorities. For Germany I can say that the adaptation of roads to the requirements of motor traffic is a matter that is troubling us greatly we are however looking forward to the future with optimism in the hope of overcoming all difficulties.

IBRAHIM ZAKI BEY (Director General of the Department of Bridges and Roads Egypt). The development of roads in Egypt has up to now been practically negligible. In the district of Minyah there were 53 automobiles in 1925 but now there are 1 825. In the district of Fayoum there were only a few automobiles in 1925 but now there are 527. Similarly in the district of Beni Suef there were no automobiles at all in 1925 but there are 625 to day. In 1922 there were 4 200 kilometres (2 625 miles) of roads in Egypt and there are now 5 495 kilometres (3 435 miles) which shows that a fairly rapid progress is taking place. The difficulty of the Egyptian Government in dealing with the roads as with other countries is mainly a financial one. At present there are no taxes whatever on motor cars of any description in Egypt a project is however under consideration for imposing a tax on such vehicles and it is hoped that there will be no objection to that being done in order that the roads of Egypt may be considerably improved.

Mr INZ M S OKECKI (Ministry of Public Works Roads Department Poland). We have heard a great many things with regard to motor transport in the more important countries of the

world but I will venture to occupy a few moments to say a littl about an old agricultural country which is very poor and has very little money with which to improve its roads Nevertheless the problem of improving the roads in Poland is one of very great importance Since I have been in England I have learned many things of great value to me particularly with regard to second class roads I have learned that it is possible to construct the second class roads reasonably cheaply by using local materials and that is a practice which I think we can apply with great advantage in many parts of Poland where it is impossible for us to build the very modern roads of which so many are to be seen in England and parts of the Continent In many parts of Poland the local material available is limestone and I think it is possible to make a good road surface with this material although it will not be so good as a concrete surface We have also used vitrified bricks for road making with very good results Indeed during the war roads built in this way withstood very heavy traffic in a wonderful manner and are even now in quite good condition I cannot say that the roads are as good as the British asphalt roads but they are quite sufficient for the general traffic which we get upon them

We have about 30 000 miles of roads in Poland and most of them are water bound macadam We realise that the country cannot develop as it should without good roads and increasing motor traffic but we also appreciate that the development of road transport must be carried on in the closest co operation with the railways The needs of Poland in regard to mechanical transport on the roads are somewhat different from those of other countries because owing to the poorer quality of the material which we have available for road building we require a lighter type of vehicle for carrying goods and passengers than can be accommodated in other countries in order that our less perfect roads may not be seriously damaged very quickly That there is room for a vast extension of road motor transport vehicles is shown by the fact that at present we have only one vehicle for every 2 000 people and there is in Poland a great opportunity for the motor manufacturer as we do not yet build our own motor vehicles

Mr Tatsuo Otaki (Tokyo Motor Transport Association) We have travelled to this country to attend this Congress via Siberia and on our journey we saw to our great regret the poor development of natural resources in Manchuria (Northern China) and Siberia because of the lack of roads for the all important motor transport But these are not the only countries in the world that are in such a predicament Most of these countries however have not the necessary capital to build roads and we should like to suggest that the members of this Congress should seriously consider the possibility of the establishment of an International Road Building Company or Corporation or of some other method for the building of these roads

do not, and I think a little co-ordination would help the motor industry which can then suit the tyres or vehicles to the best roads the road engineer can produce

The CHAIRMAN Speaking for myself I can only say I am very sorry that we have not got a much longer time to discuss this subject this afternoon because I am sure there are many other delegates who would have been delighted to have spoken in the discussion Many suggestions have been made and I am sure that out of this Congress will come much useful information from the experts from the countries in different parts of the world upon this very important question of roads which as the Home Secretary said is such a vital one to civilisation Some of the suggestions made by Mr Rees Jeffreys were very interesting especially where he looked forward to being able to drive a car from Boulogne to Asia without any interference in the matter of Customs I dare say that is simple I do not know—(laughter)—but it seems rather drastic The League of Nations has failed perhaps but there is no reason why this World Motor Congress should not take this task on Another thing I liked very much indeed was the statement by Senatore Crespi that as Chairman of the Royal Automobile Club of Italy he had the handling of all the money from motor taxation and the spending of it on the roads That is a suggestion I should like to put forward to our own Government (Laughter) On the other hand I am not quite certain that I like the idea of the President of the Automobile Club being appointed by the Government At any rate I should like to know which Government first (Renewed laughter) I am not quite certain that we should not pay rather dearly for the privilege of having a Government institution

We have had a most interesting discussion and I confess that when Mr Wyatt and others first mentioned to me the idea of this World Congress I was a little doubtful whether we should get representatives from all the countries of the world as we wanted to come here in the middle of November because our climate in November has a most unenviable reputation I am glad to see however the delegates have braved the difficulties and come here It is true most of you have been having just as bad weather in your own countries as we have but in any case it is most gratifying to see you turning up here in such excellent forces to attend this Congress

The second session then closed

THIRD SESSION *of the*

World Motor Transport Congress

HELD AT

THE SAVOY HOTEL, LONDON, W.C 1.

ON

Tuesday, November 15th, 1927

SIR EDWARD MANVILLE, J.P.
Past President of the Society of Motor Manufacturers and Traders Ltd Etc)
in the Chair

Subject of Discussion: "The Development of Motor Vehicles suitable for Service on Bad Roads and for Cross-Country Use "

The CHAIRMAN The subject for discussion this morning is The Development of Motor Vehicles Suitable for Service on Bad Roads and for Cross Country Use, and there are several papers to be introduced The discussion will be opened by Lord Montagu of Beaulieu who attends as a delegate of the Roads Improvement Association of this country I venture to say that there are few men in the United Kingdom who can speak with more authority on this subject than Lord Montagu who has been connected with the advancement of automobilism in this country since the first days of its inception He was a member of the Road Board from 1909 to 1919 and was also Adviser on Mechanical Transport Services to the Government of India from 1915 to 1919

LORD MONTAGU OF BEAULIEU It is a great honour to have been entrusted with the opening of this very important discussion o transport vehicles and their use for difficult country and for cr

country purposes I think at the outset I should call your attention to the fact that it was almost inevitable the development of the heavy motor vehicle should follow the lines which were followed between 1830 to the present day in regard to the various vehicles on railways It must be clear to you that as soon as the weight on a given number of wheels tends to increase beyond certain limits the axle weight becomes too heavy, and there is a natural tendency, and a perfectly correct tendency to distribute that weight over a larger number of wheels Thus on the railways we began with four wheels and increased to six so far as locomotives were concerned, and as the weight increases so the tendency [illegible] ond six If [illegible] n s time the [illegible] in this country to day with twelve wheels and in other countries abroad there are locomotives with even a greater number This is the natural result of designers endeavouring to keep the weight per axle low and yet to carry a much heavier weight and to ensure that with the greater tractive effort there shall be no slipping of the wheels

All will remember when the 6 wheel vehicle on the road was thought to be quite out of the range of possibilities but now we have several types of 6 wheel vehicles There are those in which all the four hind wheels drive and all the axles are independent of each other There is another kind of 6 wheeled vehicle which I will call for the sake of a brief description the Scammell type where the power unit is in the front and forms really the front wheels of the vehicle the weight carrying wheels being behind these two with what one would call a trailer behind which is attached to the power vehicle There is no doubt to my mind that for passenger and freight carrying the 6 wheel vehicle is bound to advance every year First of all there is the increase of weight which has to be reckoned with There is the desire to carry more goods and more passengers at less cost or, at any rate at the same cost as with the smaller vehicle and we see now in London 6 wheel buses already on the road carrying I am informed 68 people in which the weight per axle is less than the weight per axle with the 4 wheel vehicle which only carries 54 passengers That is a very welcome development and a very sensible one as well

We have got to remember however that the analogy between the locomotive and the motor vehicle is not quite sound and is not correct in all its implications The motor vehicle is a locomotive plus a freight wagon whereas the ordinary railway locomotive carries only its own coal and water supplies the passengers or goods being carried in a separate conveyance Therefore the motor vehicle is a locomotive plus a freight wagon The adhesion of the wheel to the road is almost as vital as it is in the case of a locomotive plus a freight wagon and there can be no doubt in the mind of anyone who has had experience

of these 6-wheel road vehicles that the way in which the four driven wheels get their grip on the road and propel the vehicle is very wonderful. This great grip is obtained over soft ground and over rough ground and over all kinds of bad roads, and it seems inconceivable until one has had personal experience of this fact.

Last February I had the fortune to take part in a convoy between Beyrout over the Lebanon to Damascus and across the desert to Baghdad, and I had as part of the convoy a 6-wheel Thornycroft wagon—one of their latest type—which had an engine of quite small power—20 h.p. R.A.C. rating developing 35 to 40 h.p.—and it took 2½ tons load across the desert, sometimes over sand and sometimes mud, and in some places very rough ground at the bottom of "nullahs" and the beds of streams that occasionally occur in the desert. I was also on an eight-cylinder Cadillac with my wife and some suit cases, and although our car went over the rough ground very well, it went over far less well than the much heavier vehicle with its six wheels. In fact, the 6-wheel vehicle in some cases, both in soft ground and over rough ground, rode in all ways much more comfortably than the touring car in which I was. I think that is rather a wonderful performance. When we got in the valley of the Euphrates there was a good deal of sand, and the 6-wheel vehicle went over this soft sandy soil with far greater ease than did the 4-wheel vehicle.

There is another point which I think is worth noting, and that is the consumption of petrol in the case of the six-wheel lorry carrying 2½ tons was something like 10 miles per gallon, whilst the consumption of the 8-cylinder Cadillac touring car, which ran in every respect quite well, was only slightly lower, namely, about 10½ to 11 miles per gallon. That I must say surprised me, and if I had not taken steps to verify the figures I should not have believed them. After that trip I became more convinced than ever of the merits of the 6-wheel vehicle for conveying goods and passengers over rough ground, or indeed anywhere. I had the honour to be Adviser to the Government of India on Motor Transport Services for several years, and my work included the organisation of motor transport on the north-west frontier and the building of roads there. I had to go carefully into the question of conveying the supplies necessary for a Division, roughly 140 tons per day, to some far frontier posts. I must pay a tribute to the Ford car in this connection, which although it only carried from 500 to 600 lbs. weight per vehicle, went over extremely rough country in a very satisfactory way. We found, however, that although it was cheaper than any other vehicle to buy, it was expensive per man and per ton of stores to run, and landed us in difficulties at times, because our object there, where we were far from supplies, was to reduce the personnel. So eventually we found that the heavier vehicle was really the more economical. It took about eight Fords to do the work of one Indian standard

lorry That meant eight drivers for the eight vehicles and it will be seen that although the cost per vehicle might be less the cost per ton or passenger moved was much greater I only make that observation because people sometimes talk about the initial cheapness of a vehicle as being everything this question must however also be looked at from the point of view of what it costs per ton or per passenger in a journey from A to B for supplies for an Army or whatever it may be

I do not intend to occupy your time at length because I know there are very interesting speakers who will follow me and we have papers which deal with the same subject but just briefly to sum up after careful thought and consideration I personally am in favour of the multi wheeled vehicle and I look forward to the time when most of the buses on the streets of London and elsewhere will be of the 6 wheel type I can also conceive the time coming when we shall have six driven wheels and not four and that the road motor will be an 8 wheel vehicle The passenger coach on the railways I may remind you again began as a 4 wheel vehicle Now there are many of them fitted with twelve wheels in two 6 wheel bogies at each end and the same development is bound to occur in road transport Moreover I should like to emphasise the point that the weight borne on such vehicles is more evenly distributed and there is less strain on the road There is less impact where the road is rough and therefore there should be less objection from the point of view of the road maker and repairer to the use of such vehicles

Major Gen G F DAVIES C B C M G C B E (Director of Supplies and Transport British War Office) presented the paper submitted by the British War Office on this subject (see Section II) and said I do not propose to deal in detail with the paper submitted by the War Office The paper gives you in very brief form the development as we have seen it from 1919 to the present day I am glad to see that other papers have been prepared on this subject because I know it is one of very great interest and I would refer particularly to those submitted by Sir John Thornycroft and Col T M Hutchinson As regards War Office requirements I think nobody would dispute that they harmonise and synchronise with the requirements of our Dominions and Colonies We have of necessity to operate over bad roads and even over no roads at all over sand and over the roughest of country and therefore we can see eye to eye with the Colonies as regards our difficulties I will if I may just touch briefly on what we consider the War Office requirements

reasonable first cost (7) economy in running and maintenance

(8) attractiveness to the commercial user at home and in the Colonies and Dominions and (9) ease of handling

In 1919 we formed our Motor Transport Advisory Board and on this Board we had several leading civilians in the motor industry and also a certain number of soldiers The first specification that was drawn up was for the 30 cwt lorry and the War Office at that time considered that pneumatic tyres were essential This specification was very well received by the motor industry To help it the War Office gave a subsidy and a certain number of vehicles were subsidised to give the design an impetus and also for the War Office to get their vehicles when required The subsidy was soon full and that rather went to prove that the specification could not be very far wrong Since this developments have been very rapid and we have now issued a specification for the medium 6-wheeler which we hope to subsidise in lieu of the 30 cwt lorry when the time of the previous subsidy falls in

I was very interested in a paper that was read yesterday dealing with Palestine I myself spent practically the whole war period in Egypt Palestine and Syria and it was there my duty to control many forms of transport from the donkey camel horse to mechanical transport The mechanical transport we had out there mainly consisted of the 3 ton lorry The vehicle although it could operate well on good ground was perfectly useless for sand and when we got to the areas of cotton soil when the rains came it was entirely inoperative and we had to be careful to get that type of vehicle out of this area before the rains came I feel very confident from recent experience that the 6 wheeler will not be held up by sand in fact I think with good road reconnaissance one could always take it over the sand but I would not like to say the same thing for the rain soaked cotton soil which has literally no bottom to it That however may be overcome yet and after all the cotton soil dries up very quickly and it could be got round by working on the edge of the sand or nearer to the mountains Again I have had a certain amount of experience in transport of all forms in South Africa as I have travelled all over Natal and the greater part of the Transvaal part of the Orange River Colony and also Cape Colony I feel fairly confident that the 6 wheel vehicle would not be held up to any extent in that country at all Sir John Thornycroft mentions in his paper the help that the motor industry has received from the Army engineers in regard to mechanical transport and there are two points to which I would like to refer One is the method of rear axle suspension by means of free and unstressed articulation and evenly balanced load distribution severe conditions of tractive and braking effect being assumed within certain specified limits The second point is the overall chain The credit for this is entirely due to Col Niblett who was I believe at one time works manager to Sir John Thornycroft He joined us at the beginning of the war however and

has served with us ever since, and we feel that a very deep debt of gratitude is due to him for the work he has done for us

I have not touched at all on the question of the track vehicle That is outside my province because it is a subject which is not dealt with from the military aspect I can only say I am perfectly confident that the requirements of the Dominions and the Colonies and the War Office again harmonise I was reading the other day that masterpiece of a book, Ludwig s Life of that great soldier, probably the greatest soldier, Napoleon, and it brought home to me a certain statement made as regards Napoleon in the Pyrenees and Russia, namely, that he was held up in both countries entirely owing to lack of roads Just think for a moment how that great soldier would have revelled in the modern development of the motor industry, and had it come in his time I do not quite know what would have happened I am purely administrative, and I speak to you purely from the administrative aspect I have technical engineers here to day who will be able to answer any technical questions you wish to ask but before I sit down I should just like to say one word to the British motor industry It is that our relationship I think, has never been more friendly and more cordial The industry has helped us in every possible way they can They have taken our advice in certain matters and they have given us their advice freely We on our part are in an unique position I think of trying out their vehicles in different climates and different terrain, and I can only say this that when we do try them out we try them out thoroughly There are no half measures about it

Sir John Thornycroft, K B E , introducing his own paper (see Section II) said There is no doubt that the 6 wheeler is the vehicle of predominant interest at the present time Yesterday we were discussing transport questions in general and it seemed to me that it is impossible to ignore the 6 wheeler for travelling over countries with undeveloped roads In fact, from this point of view I do not think there is any other possible vehicle than the 6 wheeler I can claim to have been associated in the manufacture of motor vehicles as long as most people in this country, and I think the development of the last few years has been phenomenal At different intervals vehicles have been introduced for undeveloped countries and a few samples have been sent out overseas and have stopped there, very often without ever having run at all Now, however, manufacturers produce vehicles and send them to different parts of the world and get repeat orders quickly It is also of great interest to record that the development of this particular type of vehicle was a military development The military authorities of the past have generally made use of civilian development in transport but here we have the reverse We have a particular vehicle worked out for military needs so successfully that it has proved to be the solution of the problem for civilian purposes

If I might refer to some points I have put together in my

paper I would like to mention the work of the War Office and the assistance their officers have given to manufacturers One must not forget to give the French designers the credit for making a successful development of what we call here the rigid 6 wheeler but I think everyone agrees that the modifications which Col Niblett insisted on here have made it a more suitable vehicle for really bad roads and for cross country work For a vehicle which is running on a reasonably hard road the tractive effort has not to be so enormous per ton of vehicle but where a motor vehicle has got to travel over desert sands or cotton soil the tractive effort has to be about ten times that necessary for travelling on a good hard road in order to enable these soft patches to be got through That is obtained by providing, in addition to the ordinary gear box a supplementary gear which gives eight gears in all In the paper is a diagram showing the

bition will show a variety of ways of solving the problem but after all in dealing with cross country work, I think we must come back to the arrangement by which one takes the torque reaction to the frame of the vehicle and does not vary the load on the axle or bogie There are some vehicles which have not provided for this but they are probably intended for roads where the vehicle has not to give this very big tractive effort Referring to experience of vehicles in different parts of the world there was an interesting discussion yesterday about the sort of roads pneumatic tyres could go over but there is more than one service which these vehicles perform There is the service required, say by an oil company of delivering machinery up to "the back of beyond in connection with which the vehicles have to traverse forest tracks and it does not matter what happens to the road so long as the vehicle gets there the vehicle is on low gear all the time In other cases to a certain extent where the soil is sandy the pressure of the tyres tends to bind the surface and make something of a road One finds examples of many thousands of miles of that sort of thing in the San Paulo district of Brazil where they do not use a metal tyred vehicle over roads which have an excellent surface in most seasons of the year These are conditions under which the pneumatic tyre is most suitable The 6 wheel vehicle enables much greater loads to be carried than is possible when using Ford cars the only alternative type so far, and there are 6 wheel vehicles successfully running under these conditions with loads of 3 tons over thousands of miles of the type of country I have just mentioned into the Brazilian forests

In Australia 6 wheel vehicles are also being used for tank wagons for delivering in the back blocks The South African Railway Administration has a large number of services run by 6 wheel vehicles and probably South Africa has shown the greatest development of any country in this respect These

vehicles are also at work in Borneo and Singapore and generally distributed over the world you will find British made vehicles which are a development of this War Office effort I think the development has been phenomenal and it is of special interest to know that the civilian population is getting the advantage of the efforts which the military authorities have made The suggested subsidy scheme for six wheelers is of special interest in giving the users at home the chance of using these vehicles which although they may have slightly more complication than the 4 wheel vehicle have demonstrated I think that they do less damage even to our own good roads here and carry their loads with less resistance and therefore more economically

Col T M HUTCHINSON D S O O B E (Mechanical Transport Advisor India) presenting the paper prepared by the General Staff Branch of the Army Department Government of India (see Section II) said In the unavoidable absence of Major Hubbard who prepared this paper I have been asked to submit it to you and I have the honour of making a few remarks upon it On the first page of the paper you will notice under the heading ' Expansion of Roads that there is a very small mileage relatively speaking of metalled roads in India only 216 000 miles I have not worked this out in terms of road miles per square mile of country but it is a very small figure Then we go on to see that the demand for good roads will increase It has just been decided to form a Road Development Committee and sanction has been obtained from the Government of India for this Committee to get to work It will consist of nine members of Assembly and five of Council together with a Chairman making a total of fifteen and it will examine the development of the road systems of India and the means by which they can be financed and also the co ordination of road development by a Central Road Board or otherwise so that there is some prospect of development taking place The question of course is largely bound up with finance

The introduction of mechanical transport in India has to be considered in conjunction with existing transport and at the top of page 5 of the paper there is a reference to the use of transport for agricultural purposes I wish to remind you the cost of ox transport in India is very low and as the paper points out the ox is not only useful for transport but he pulls the plough and when he can no longer do that other uses are made of him even his hide is saleable It is difficult to give exact figures but I know that in certain cases one can arrange transport contracts for figures which reduced to the equivalent of British money are something like 2½d to 5d per ton mile This is a very low figure and it is difficult to visualise mechanical transport replacing ox transport on such a basis At the same time this form of transport is very slow It can only do about 15 to 20 miles a day and this alone prohibits its use for certain services such as passenger carrying the transport of fresh

vegetables and fruit stuffs I have in mind for example transport between Kashmir in the northern part of India where great difficulty is experienced in getting fruit and similar food stuffs through to market in a fresh condition We have to remember also that time in the East is not of much value although I think the East is now beginning to appreciate the value of time more than it used to, and the population is prepared to pay for getting fresh goods through in a marketable condition and for quick passenger transport Thus there is the possibility of rapid development Another point against ox transport is that it is very often hampered by weather conditions Mechanical transport is now obtainable locally in certain parts of India but its approximate cost is something like from three to six times the figure I mentioned per ton mile for ox transport It varies with the locality and the season and the prospects of a return load Nevertheless the comparison of the figures is interesting and shows that the cost of ox transport is about one fifth or one sixth of mechanical transport at the present time

The question of passenger transport is referred to on page 6 of the paper where a distinction is made between first class passenger transport meaning the tourist traffic and the movement of families about India which represents the third class traffic Generally speaking the third class traffic represents the Indian native traffic I have travelled many thousands of miles over India by road and railway especially by road and I have been surprised to see the manner in which the Indian moves about He is naturally a traveller he has been a traveller from time immemorial and it has long been the habit of the Indians to travel more than the population of any European country Thus there is a large amount of traffic to be dealt with from the outlying districts especially in the south of India

Coming to the introduction of the 6 wheel vehicle in India unfortunately Major Hubbard is not here but he has been very largely connected with its introduction to India and has been present at most of the important trials I will however go through certain points in the paper in connection with this matter The 6 wheeler referred to is of the rigid type with the weight distribution on the various axles i e the War Office type The advantage of weight and power distribution has already been pointed out by Lord Montagu and I think its effects are well known particularly as regards giving improved adhesion I want however to point out that it is not only power and weight distribution which is very important but the use of overall chains or tracks which enables these machines to do so well on poor ground is equally improved Certain tests are referred to in the paper and I think it is rather interesting to follow one or two

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the range of variation of conditions in India is much greater than in this country It is doubtful if firms and designers have realised this aspect of the matter Perhaps they have not had the opportunity of being on the spot, though in some cases it may be due to the fact that their representatives who have been to India have been unable to convey an idea of precisely what the conditions are The general requirements have already been outlined by General Davies but I think some exchange of views is desirable as to what we require under these conditions These difficulties have to be dealt with, and if we can pool our knowledge and our difficulties it will help designers and largely make for cheapness of construction in the end, because after all if the motor vehicle is to compete it will have to be produced reasonably cheaply and the less changes there are in design the better, so that the sooner we get down to the essential features for foreign and Colonial conditions the better

In addition to the points already mentioned it seems to me that one of the most important matters is the heat in this part of the world and its effect on engine cooling The loss of water is a matter of considerable importance With temperatures of 110 deg F and travelling over routes where the sun pours down on to the rocks and the heat is reflected on to the machine it is difficult to prevent vehicles from losing water There are many hill stations where the radiators can be refilled but with large convoys it is so difficult so we want to avoid refilling as much as possible and therefore we want a machine which will retain its water and not boil it away Again there are great extremes of temperature in India Although it may be hot in one part at altitudes in the winter time it is extremely cold The variation is much greater than in England I have been colder in India than I have ever been in England This affects lubrication, the oil in the lubrication pipes and sumps is liable to freeze thus it is rather important to be supplied with an oil that does not freeze at low temperatures but which at the same time will retain some body at the higher temperatures because one may start at the top of a hill in the morning with the engine practically frozen and during the day, come down to a lower level where it is extremely hot Dust is another problem In England thanks to the Ministry of Transport we have excellent roads and there is very little dust I remember some years ago before the universal tarring and water proofing of roads was undertaken, that we had a dust problem in England This problem is, however very much worse in countries where the roads have not been waterproofed and it is particularly bad in parts of India The dust we have to contend with is not gravel or sand but is fine air floated dust which remains suspended in the air half an hour after a vehicle has passed That dust is drawn into the engine and undoubtedly we require some form of air filter to keep it out it must however not be too complicated or expensive or require a lot of attention Smaller matters needing attention

are the effective ventilation of the driver s cab In a good many machines in England the drivers can be very cosy in cold weather, and a little uncomfortable in warm weather but abroad in hot climates, it is like sitting in an oven and very draughty ventilation is necessary to make the driver at all comfortable If proper ventilation is not provided the driver will break down because he

or in units

to the chassis The so called rigid frame is considerably distorted in travelling over rough ground and our later experience shows that we must consider improvements in the attachment of our units to prevent damage both to the body and to the units themselves Brakes are another matter which require attention They must be durable and have plenty of accessible adjustment Where we have long hills 15 to 20 miles long a considerable amount of wear takes place and I know cases of lorries which have done well in this country but after one run down a hill in India they wanted adjustment Frequently it has been impossible for any further adjustment to be made and the brakes have had to be re lined Therefore we want more durable brakes which will stand a considerable period of use In the heavier class of vehicles some form of mechanical relay brake is desirable either the servo type or something of that sort The point is that the Indian driver in physical strength is not equal to the European I should say that his physical strength is about two thirds of that which the European driver is able to apply In fact I have seen some brakes with which an European driver can scarcely hold the vehicle on a hill but when an Indian driver tries to operate the same brakes on a bad hill he is up against a real difficulty As most of these machines will have to be driven by local drivers we shall have to make sure that the braking systems are effective

Sir John Thornycroft has stated that the civilian has adopted a vehicle in use by the Army and that civilian users have benefitted considerably from Army experience I should like to add that the Army in turn has benefitted from the assistance given by manufacturers We have found them most helpful in all our problems and many of them I am afraid are very disturbing from the manufacturing point of view but we do appreciate the help we have had from the manufacturers I should further like to point out however that the Army is doing another service in training drivers and

these overseas countries A large number of civilian motor transport vehicles in India are now being operated by ex service Indian drivers and mechanics and in this way they are helping

propaganda and development Finally I would like to impress the importance of effective technical service by qualified representatives of the manufacturers concerned I know it is an expense to a firm and difficult perhaps for them to justify it in the initial stages, but it does make a considerable difference to the subsequent sale of the machines and their development if prospective purchasers know they have available a qualified representative who can repair and adjust their machines and who can supply spare parts when necessary That is the important thing and I think would largely help to development in the use of mechanical transport vehicles under Indian conditions

M I BACQUEYRISSE (Directeur General de l Exploitation et des Services Techniques de la Société des Transports en Commun de la Region Parisienne) then presented his paper dealing with the 6 wheel motor bus and the use of coal gas on vehicles (see Section II) Summarising the advantages of 6 wheel buses as a result of his experience with them in Paris M Bacqueyrisse stated that they brought about a reduction in tyre wear and in the cost of maintenance both of bodywork and the mechanical parts of the chassis As regards the use of coal gas as the fuel for the engines of motor vehicles this has been brought a stage nearer by the introduction of a piano wire wound container weighing only 5 kilogs (11 lbs) per cubic metre of content capacity As compared with commercial motor spirit coal gas showed an economy in calories of 10 per cent due in his opinion to the greater homogenity of the carburetted mixture In conclusion he drew attention to the paper on the subject of the use of coal gas for the engines of motor vehicles recently read by M Castaing the chief engineer of th S T C R P at a meeting of the Union des Voies Ferrées d Interet Local et Transports Automobiles

Col R E CROMPTON (Royal Automobile Club) I only wish to tell Col Hutchinson and Sir John Thornycroft that the country of the whole world where mechanical transport can be worked to profit and to enormous advantage is India—the country of plains and pretty hard plains With my engines 50 years ago we traversed those plains at high speeds even in those days I will tell you this lest we forget In the years from 1858 to 1877 I was employed by the Government of India to develop mechanical transport for the Army and in order to get the practice to carry out our work properly we carried goods and passengers for about seven years I do not know how many passengers we carried but roughly speaking we completed three million ton miles and there are very few parts of the world where similar work has been done in the same time The secret was the extreme ease of our Indian roads There were no gradients to speak of and we were masters of the situation The natives called me the rubber wallah because we used rubber tyres which they had then seen for the first time But this is the interesting thing I was then as Col Hutchinson

has mentioned to day up against the bullock man with his two miles an hour and in those days his cost was only 2d per mile and I was told I had to beat that Well in my last year in India I had reached an average of seven miles an hour and had carried 5 tons as a maximum net load per train and I had got down to an average price of 5d per ton mile at seven miles an hour Such a result has never been obtained since either in Europe or India or anywhere else although we were then handicapped for we had wood fuel for developing steam and we also had to use native drivers I will say here however that the native driver is a fine fellow Mine were Punjab boatmen originally but they were as good as many English drivers One thing Col Hutchinson spoke of which I also experienced in India and that is the dust It was terrific My 130 H P engine dragging behind it nineteen wagons suffered severely from this dust Although the engine was in front sometimes we had a wind from the rear and what we had to do was to make our engine casing absolutely dust tight In fact we had to provide a positive pressure on the inside to give a little flow outwards and in that way we kept down our engine repairs These in the first few years were chiefly necessitated by dust but in the last few years they entirely disappeared I am 82 years old and my assistant at that time is now 86 years old and we are dining together to night as two of the founders of the Automobile Club Therefore mechanical transport in India does not kill you (Laughter)

Mr GUNNAR LINDMARK (Royal Automobile Club of Sweden) In connection with the subject discussed here this morning it might interest you to learn something about the winter traffic in the northern part of Sweden As probably at least some of you know Sweden is a very oblong country the southern part having nearly the same climate as England or the northern part of Germany and the northern part stretching above the Arctic circle having the most severe conditions with deep snow and low temperature during several months or more than half the year If we go back only about five years we will find that at that time practically all winter traffic in the northern part of Sweden was managed by the aid of horses The system of clearing the roads of the snow was at that time most primitive being done by horse drawn ploughs These were not very effective the result being a channel about 3 metres wide (nearly 10 ft) with high snow walls at the sides of same and they also left deep snow on the road surface Consequently such roads were not very well suitable for motor vehicles and furthermore the roads suffered very much from the melting snow making the surfaces weak during autumn and spring

About five years ago the Post Office authorities inaugurated regular motor bus services through the northern part of Sweden as well in the coast land as in the interior part known as Lappland for conveying mail and passengers winter and summer

In looking round for suitable vehicles I am glad to say that the choice fell on the Swedish motor bus Scania Vabis manu factured by the Company of which I have the honour to be the General Manager and President You will understand the strains on these mail carrying buses during the winter when I tell you that on some days they have to run 12 15 hours on the lowest gear and with practically full load on the engine No wonder then that the oil in the gear

although the tempera
below zero The first
gear in the rear axle

and with four gears in the gear box consequently eight different gear ratios could be obtained The front wheels were equipped with skis and the rear wheels with a special type of caterpillar with a wide rubber belt around the wheels and two pairs of rolls This equipment could be comparatively easily detached when not required The buses also carried snow ploughs The buses are used to carry the passengers the mail being carried in trailers which in the winter runs on skis

However during the last few years the method of clearing off the snow from the roads in the northern part of Sweden has improved greatly and is now effectively performed by the aid of powerful 3 ton trucks and buses equipped with snow ploughs in front and on one side Now practically all main roads in northern Sweden are kept open for motor traffic all the winter through The main roads are thus brought into a comparatively good condition with only sufficient snow left for the sledges and no snow walls at the sides A speed of 15 20 miles per hour of the tr ll snow away from very favour able as ordinary 4 wheelers with twin tyres on the rear wheels which are com paratively large in diameter and the caterpillar system as a rule has been abolished as also has the extra gear in the rear axle this being possible owing to the roads being kept in better con dition However the strains on the buses still are very severe regular traffic being maintained independently of the weather—in snow storms etc In all some 70 motor buses are now being run in northern Sweden in regular daily service winter and

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The mail buses having opened the way for other traffic a great number of private buses and trucks now run in the northern part of Sweden all the winter and probably there is no country in the world where winter traffic to such extent and under such difficult conditions exists

Perhaps I have taken too much of your time but I hope that what I have said has been of some interest to you I might also

mention that the Russian postal authorities have bought a number of Swedish built buses for winter traffic in Siberia We also have had an enquiry from Russia for large size passenger cars to be able to run at a speed of 40 miles per hour through 1 metre (39 in) of deep snow but we were sorry to have to reply that such marvels do not yet exist

Mr R H BRACKENBURY (Empire Marketing Board) At the morning session yesterday I endeavoured to emphasise what I conceive to be the crux of the transport problem in vast semi developed sparsely populated continents such as Africa or Australia There is an economic gap between the cost of railway transport and that of any other kind of mechanical or animal transport A railway worked to capacity can carry produce for a penny or two per ton mile whereas a motor lorry charges 1s or 1s 6d for the same service

A very inadequate attempt is made to bridge this gap by stretching every form of transport service far beyond its economic limit We find at one end of the scale that branch railways have been built where branch railways have no economic business to be At the other end of the scale we see human beings carrying produce on their heads for 50 or 100 miles It is an economic crime to take men away from productive labour and turn them into beasts of burden True there is an economic radius within which a human porter can quite properly be used There are possibly more human porters at work in the docks markets and railway stations of London than in many a West African Colony but the radius over which they operate is measured in yards and not miles In the same way the radius at which a light lorry can be worked economically is very limited The radius extends however as the load carried increases and passing through two and three tonners on four and six wheels we come to the latest types of balloon tyred rigid framed six wheelers carrying with a trailer a useful load of five tons or so This is undoubtedly the most efficient form of motor vehicle to day it probably has an economic radius of operation in Tropical Africa of 50 miles or so and can carry produce at perhaps 1s per ton mile

Unfortunately it is seldom possible to build railways in these sparsely populated continents at less intervals than 300 or 400 miles An effective feeder for those railways should therefore have an economic radius of 150 to 200 miles

If now I am right in stating that the present most advanced type of motor vehicle charges 1s a ton mile and has an economic radius of 50 miles then it is a mathematical consequence that a transport unit which is to have an economic radius of 200 miles must be able to carry produce at 3d or so a ton mile

It is interesting to speculate on the probable characteristics of this long distance feeder to the arterial railways While doubtless the details will vary to meet the requirements of the country in which the feeder is to be used there are nevertheless

certain underlying principles which apply whatever the local conditions may be

These principles are three in number and may be stated like postulates or axioms

In the first place, in order to carry produce cheaply it must be carried in bulk Fifty or 100 tons at a time rather than in two or three ton lots

In the second place, the transport unit which is to carry these large loads must be of such a character that it can traverse earth surfaces without destroying them Preferably it should consolidate and improve them

In the third place a prime mover of a more economical type than the petrol engine must be installed particularly if the route which this long distance feeder to the railway has to traverse is far up country and thus a long way from a sea port

Perhaps I may be allowed to amplify these three propositions In regard to the first—that in order to carry produce cheaply it must be carried in bulk—I would like to draw attention to the railway A railway does not carry produce cheaply for any other reason than that the laying of rails enables large loads to be taken at a time If small loads of two or three tons at a time were sent down on motor lorries fitted to run on rails the cost per ton mile —provided the interest on the capital cost of the rails is included —would be very high A cargo boat can carry produce from Canada to Great Britain at one twentieth of a penny per ton mile only because the load is reckoned in thousands of tons at a time Motor boats carrying two or three tons at a time would not be particularly economical

My second proposition is to the effect that a transport unit designed to carry the large quantities which I have indicated must be of such a character that it will not cut up the ground it passes over I do not want to labour the obvious but perhaps it is necessary to point out that we are dealing with thinly populated districts such for example as Northern Rhodesia where we have an average population of three to the square mile or, taking the case of Australia where as Mr McDougall told us, large areas are inhabited by no more than one or less to the square mile In such sparsely populated countries it is clearly not possible to provide anything more than earth roads, and if these earth roads are cut up they presumably have to be re paired but where are the men to come from to do this work? Alternatively if the roads are not repaired in time they become impassable What is wanted then is a transport unit which will not cut up the roads but preferably, one which will tread them flat and consolidate them

And finally I come to the question of the prime mover In the valuable paper on Transport in Australia it was stated that petrol which costs at the ports 2s a gallon, gradually rises as one proceeds inland until it may even reach a price of 5s or mo

per gallon Precisely the same thing occurs in Africa The petrol engine is, at the best, an extravagant form of power unit, and is only used where the question of cost comes secondary to the question of weight Where, however, weight is not of much importance, then at once one of the three practical alternatives to the petrol engine is generally adopted I refer, of course to the steam engine the Diesel engine or the suction gas engine The suggestion has been made that fuel alcohol can be produced at an economical cost up country This may be so but for the moment I think that we can rest satisfied with one of the three alternatives mentioned above

The ideal long distance feeder might then take the form of a powerful tractor using a local fuel or alternatively driven by a Diesel engine using crude oil Such a tractor driven by a 300 H P engine mounted on flexible tracks is a practical vehicle to day—perhaps not strictly commercial, but it would soon become so after the first few experimental units had been perfected Such a tractor could draw behind it large capacity trailers also mounted on a system of tracks A road transport train of this character can be designed which will carry a useful load of 50 or 100 tons or more, while yet exerting on the ground pressure of only 10 or 12 lbs to the square inch I may say by way of comparison that the pressure of a man walking is usually taken at 10 15 lbs per sq in while that of a horse is 75 lbs per sq in It is pressure per square inch which destroys the surface of ground Provided the pressures are kept low enough, the ground will not be cut up At a pressure of 10 12 lbs per sq in , most surfaces are positively improved Anybody who has had occasion to use the native paths in Africa will have noticed the smooth polished surface which is left by the passage of bare feet The ordinary pedal bicycle tends rather to smooth out the ground it passes over than to cut it up The total load is immaterial It is the pressure per square inch on the ground which is the decisive factor

Finally I would like to emphasise the point that the long distance feeder to the railway is in no way a substitute for existing methods of mechanical transport Obviously 100 ton loads are not to be picked up anywhere but must be brought to collecting centres by means of the usual types of motor vehicles and other forms of transport The big unit may be expected rather to stimulate the increased use of motor transport of all kinds by linking up with the railway fertile districts at present lying dormant

Major G C Rowe (Senior Military Representative of the Australian Commonwealth in London) Our Army mechanical transport problems in Australia are also the problems of the com mercial transport firms and of the producers of primary products and raw materials As most of you know, at present we have in Australia no firms manufacturing motor transport vehicles, and in

the past very few firms outside Australia who manufacture vehicles have considered that our market has been of sufficient importance to warrant the incorporation in any of their vehicles of those special features which our local conditions of *terrain* and climate call for Some firms certainly did send out a technical representative but I am afraid their voices were just like those voices in the wilderness It almost seems as if manufacturers thought —well—Australia is a very long way off it is a big country with a small population and after all there are plenty of horses and bullocks there These facts are certainly true but I am afraid our progress has been slightly retarded because that point of view has been taken up However as a result of the consideration which was given to the requirements of the Army mechanical transport vehicles by that Committee to which Gen Davies has referred the 30 cwt subsidy type came into being and, owing to its improved cross country performance and the incorporation of certain features the motor manufacturers of Great Britain whose interest in the potentialities of the Australian market by this time had been stimulated started to look ahead and try to interest their overseas customers in this particular type of vehicle I think they met with considerable success This 30 cwt vehicle was a very big advance on anything we previously had but going still further the introduction of the 6 wheel vehicle and also the semi track vehicle is a much bigger step forward

We have I think in Australia practically all those conditions of *terrain* and climate which the War Office had in mind when they were considering the specification for their Army transport vehicles and it is a logical conclusion that vehicles which are built to these specifications will meet the requirements of our commercial civilian users There are quite a number of 6 wheel vehicles in use in Australia at the moment many of them as you have heard being used by the big oil firms The Commonwealth railways also have some working up in the interior and I am certain of my facts in saying that they are being run with complete satisfaction and economically both on the roads and up in the interior where no roads—as roads—exist It seems to me therefore that we have in sight a solution to one of our transport problems namely the carriage of reasonably small loads over reasonable distances

Mr Brackenbury has just referred to one of our other problems —the bridging of the gap between the point at which loads of say 100 tons can be picked up by the railways and the points where these loads have to be collected namely from the primary producers For myself I do not see a solution in sight at the moment Mr Brackenbury has put forward one suggestion which is worthy of very serious consideration and I would ask the members of this Congress if they will be so good as to give this problem very serious consideration We in Australia will be very glad indeed to hear anything they can suggest

Mr HENRY C JENKINS (Consulting Engineer to the New South Wales Government) Mr Brackenbury has approached the point from another angle from that which I was looking at it and has expressed an opinion which I have come to from quite another point of view upon what is the position of the tractor in these back blocks propositions One of the difficulties that we all know of is that of idle plant In the handling of crops and produce one difficulty with the public services of course is that with the plant which must be kept about or else shifted to long distances so as to handle the produce during a very short period of the year Co operation between the various interests in a country like Australia might ensure the use of this plant over a greater period of the year and the tractor aided by the trailer does seem to me to be one way by which economy can be secured I am not prepared to go so far as Mr Brackenbury in his 300 H P tractor set proposal because such a tractor would be rather a formidable weapon for a farmer to use The latter needs a smaller one and by means of trailers he could get much of his produce at his own convenience down to certain points where the 6 wheel vehicle can meet him provided he has a right of way and some facilities for getting there Sometimes the farmer has to go through the rivers and meets with various other obstacles and the provision of fords or ferries would assist considerably Bridges are a luxury which we cannot think much about in some of these countries and the provision of fords and ferries and a right of way would get over one part of the difficulty whilst if the use of the trailer is developed the man himself can use it during a part of the year and he would take his own goods when it suited him down to some point where he could be more conveniently reached than at the present moment I agree that it is an economical crime to use men carrying loads on their heads but there are places where men so earn their living I have had to have a string of men 200 or 300 men travelling on foot with loads over long distances and that should be avoided as soon as possible The 6 wheel vehicle does seem to be a solution of the problem where some form of road exists but we are now speaking of places where there is no development of the roads at all

Mr C RAJAM (India) Many of the roads in India are in the most primitive condition but certain roads are quite good for motor traffic In the Madras Presidency there are thousands of miles of sand and earth roads which are absolutely useless for motor transport It is the duty of the Government to see that the roads are put in a suitable condition for the use of motor traffic *especially for conveying goods from the different agricul*tural areas to the markets At the present time the Government is trying to improve these roads but the difficulty is finance What I consider would be the best plan would be to impose a duty on petrol to meet the cost of modernising the roads There is also a great deal of dust nuisance in India which makes it exceedingly difficult for traffic when it becomes at all dense

and to eliminate that dust nuisance it is necessary to have modern road construction such as tar macadam or asphalt In Rangoon Singapore and Penang there are thousands of miles of roads in very good condition and there is a road from Calcutta to Delhi and from Delhi to Kashmir which is kept in very good condition If however it were tarred the traffic conditions would improve considerably and people would be able to use that road to go from Calcutta to Kashmir without any difficulty whatever

With regard to the use of light motor vehicles for Post Office and similar purposes in India and other countries I have travelled through Czechoslovakia Germany France Switzerland and almost the whole of England and Scotland and wherever I go I see the wonderful Ford car is used for this purpose In the postal services in Madras and Calcutta Ford cars are used and they do not let you down at any time but the trouble is that although the Ford is the cheapest to buy the cost of maintenance is excessive I have a number of English lorries Commercars and Albions which give no trouble but the initial cost is high and I would urge manufacturers to concentrate attention on the manufacture of one ton and three quarter ton lorries capable of carrying mails and also for bus services in small district towns in India In Calcutta and Madras the large single deck buses run in England would be suitable but in the outer districts it is absolutely necessary to have one ton and three quarter ton chassis for buses and postal services I have seen many of the manufacturers in England and on the Continent but nobody seems to have devoted their attention to such vehicles but I believe they would sell thousands of them for use as buses as well as for the postal service in India

Mr NORMAN NAIRN (Nairn Eastern Transport Co) As some of you may be aware we are now running a service of passenger vehicles between Haifa and Baghdad This is a 6 wheel proposition the vehicles being of American design At present we are running four Pullman 6 wheelers and the point that has struck us about these vehicles is the manner in which they travel through the sand and mud and the high speed which can be maintained over bad country It is necessary for Colonial work that these vehicles should have six cylinder engines The ques[illegible]
and [illegible]
We [illegible]
on the desert of course there is no shade but we are getting very satisfactory results with a very large radiator and large fan in conjunction with a condenser We have had a great deal of trouble with our internal expanding brakes which are not enclosed and on three or four trips it was necessary to take them down and remove the dust That is a very serious problem of the desert Similarly in regard to the construction of bodies, there is considerable torsional strains I do not know how these can be overcome but it may be possible to do it by adopting

construction similar to aeroplane bracing and if these strains can be overcome it would be a great benefit For braking our experience shows us that on the 7½ ton Pullman cars the foot operated brake is impossible and there must be some mechanical means of braking I can only say that after the experience of twelve months with these 6 wheel cars between Haifa and Baghdad I am solid on the 6 wheel proposition until there is an 8 wheeler In conclusion I would like to congratulate the English manufacturers on the very great advance which has taken place this year in the construction of 6 wheel vehicles

The third session then closed

LUNCHEON TO DELEGATES

At the luncheon to day the principal guest was Major General the Rt Hon Sir Granville Ryrie C B K C M G V D High Commissioner for the Commonwealth of Australia Sir Edward Manville presided

The toasts of H M The King and H R H the Prince of Wales (President of the Congress) were duly honoured

The CHAIRMAN in introducing Sir Granville Ryrie said We have great interest in Sir Granville at the present time because as you are all aware the automobile industry of this country sent out a delegation to Australia and that *delegation has just* returned to England after making a very extensive tour of Australia and New Zealand and we hope for great things in the British automobile industry as the result of that visit We had the pleasure the other evening of hearing Sir Granville Ryrie at the dinner preceding the opening of the exhibition of private cars at Olympia and it was the first time we had come into actual contact with him but he left if I may say so a most favourable impression and therefore I have no doubt you are looking forward with pleasurable anticipation to hearing what he is going to say to us this afternoon

SIR GRANVILLE RYRIE after some amusing comments of the events that led t[illegible]
Australia said
or the greatest ir
particularly with
Mother Country This is a World Congress I know but I am sure you will pardon me dealing with this particular point at the moment *I think you will agree that Australia is one of the best* customers of the British motor industry to day and it will be a larger customer as time goes on In 1924 Australia took 25 per cent of the motor car exports of the United Kingdom and in 1926 she took 46 per cent Of chassis alone in the latter year Australia took 80 per cent I think that is a creditable performance In addition Australia was the principal market for British bicycles motor cycles and commercial motor vehicles

I think that this position between Australia and the Mother Country is due in a large measure to our preferential tariff, but it is due also to the keen interest that is manifested by British motor manufacturers in what we are doing in Australia At the same time I should like to say I think the motor manufacturers of this country slipped badly a few years ago when they allowed our American cousins—I do not say this disparagingly in any way of our American cousins, because they are a pushing race and deserve all the success they get—to get into Australia, and British makers, I say, slipped badly in not getting into the Australian trade at the same time It was all left to the Americans and the result to day is that in Australia the chief business is done in American cars What you have recently done, viz, sent a delegation to study the conditions of Australia ought to have been done previously because you would then have been able to reap the very great benefit of the Australian trade

I am not ashamed to state that the first car I bought was a Ford With all due respect, I say that the Ford was a very excellent little car, and it served my purpose very well There were thousands and tens of thousands of Ford cars sold in Australia before the British makers came into the market at all As a matter of fact it was not possible for me to buy a more expensive car and the same is true of a great many people in Australia to-day All I wanted was a car which was suitable for rough work in the bush As I was a station owner and wanted a car suitable for these rough parts I looked round and decided that the Ford was the most suitable for my work It had a high clearance suitable for the rough roads, low gear, high power with the minimum number of gears, and that is one reason why British made cars are not suitable for Australian conditions—
[illegible] sh country
changing
[illegible] he British
manufacturers will not find fault with me for giving them a little lecture as it were, but I just wanted to tell them that they slipped badly some years back at the commencement of the motor trade in Australia

There is no doubt that Australia promises to be one of the greatest markets for the motor manufacturers of the world We have great spaces in Australia which must be served by some form of transport, whether it be rail or motor road transport Good roads will mean, of course, good motor traffic and in my opinion in the country parts of Australia it is far better to build good roads than to build railways If we get good roads we shall get all the transport we want The Australian problems are typical of those of all the other countries of the southern hemisphere [illegible], all the conditions to be [illegible] South Africa, New Zeal[illegible] news to some of you that we have a ski ing carnival in Australia and at one

time we could not get along to the headquarters of the ski ing Club owing to the snow In other parts of Australia we have tropical conditions with long periods of drought and better trans portation between those districts suffering from drought and the non affected areas would be of the greatest possible advantage all round

I would like to call to your attention the recent International Economic Conference at Geneva This Conference came to the *unanimous conclusion that the prosperity of industry throughout* the world depended on the prosperity of agriculture I need hardly remind you of the tremendous part that transport plays in ensuring strong agricultural progress and if the motor manu facturers of the world can improve the conditions of transport for rural areas they will be doing a very good deal to improve the position of agriculture not only in Australia but throughout the world If they do that and they improve as a consequence the standard of living of the primary producer then the primary pro ducer will be able to purchase more manufactured goods which will react to the benefit of manufacturers generally Therefore I think it is essential that you should study the conditions in Australia and in other comparatively undeveloped areas for yourselves because undoubtedly there is a tremendous field for the motor manufacturers of the world

There is one thing which needs consideration and that is the price of petrol The price of petrol in Australia is a tremendous handicap to us In Sydney we have to pay 2s 4d per gallon and the price is about the same in Melbourne but when you get to the back blocks the price is 4s 6d and over which is a very serious drawback I understand that in the United States petrol can be obtained at 10d per gallon but although we are big share holders in the Anglo Persian Oil Co we have to pay 2s 4d in Sydney I think that is ridiculous and it should be possible for somebody to do something to put that right Amalgamations are taking place and I do not know whether the profits are going into the pockets of the big trusts Anyhow there cannot possibly be that amount of expense entailed in the transport of oil in tankers as is represented in the difference in price which I have mentioned We have Commonwealth refineries but we cannot refine enough for our own needs However I will conclude by saying that I hope this World Motor Transport Congress will result in something being done in my country in regard to improv ing the facilities for transporting goods and passengers because it is upon transport that the prosperity of the Empire and incidentally the prosperity of the whole world depends

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FOURTH SESSION *of the*

World Motor Transport Congress

HELD AT

THE SAVOY HOTEL, LONDON, W.C.1.

ON

Tuesday, November 15th, 1927.

M. ADRIEN LACHENAL

(Member of Sw ss Parliament and Delega e of the Touring Club Suisse)

in the Chair

Subject of Discussion: "The Improvement of Facilities for International Travel by Road."

Mr HORACE WYATT (Organiser of the Congress), said Gentl men befc
that Mr
afternoon
orders I think you would wish that I should transmi
expression of your regret to Mr McWhirter (Hear
Under the circumst inces we are very fortunate to ha
at short notice a very able deputy for Mr McWhir r
M Adrien Lachenal who is a Member of Parl
Switzerland and is here representing the Touri
Switzerland I think the fact that M Lachenal
this afternoon is a very happy reference to th
character of this Congress and particularly to th
Switzerland as the centre of international affairs

The CHAIRMAN As my friend Mr Stenson
advised me to speak only in English, I will try
as possible to preside at this meeting But let
how greatly I am honoured, on behalf of Switzer
small country and also on behalf of the Swis
in having been called upon to direct your d
thank your honoured assembly very heartily for
to express to our London friends—and in d
am interpreting the feelings of the delegates
tries here—how very pleased and deeply appre

the remarkable and amiable way in which they have organised the reception of the foreign delegations You have once more been true to the world famed English tradition of hospitality

The subject which delegates to this Congress will be invited to discuss this afternoon is Improvement of Facilities for International Travel by Road' If there has been any doubt in the minds of delegates as to the world wide interest of this subject I am sure that the representative nature of this meeting has removed it We have however a further indication of its importance in the presence amongst us of a member of the Cabinet of the British Government the Secretary of State for India, Earl Birkenhead That Lord Birkenhead with his many engagements should spare time this afternoon to attend our gathering is a compliment which we all recognise I think I shall fall in with the wishes of the delegates if I restrict my opening remarks to these few words and ask Lord Birkenhead now to do us the honour of opening the session

The Rt Hon the EARL OF BIRKENHEAD You M Lachenal opened your observations by making a wholly unnecessary apology for your inacquaintance with the English language Few indeed of us I suspect would not feel very proud if we could rise in your country and open proceedings of this kind so gracefully and so accurately as you have done for us to day Now gentlemen this Congress seems to me to be one of very high importance Your Chairman has said it is satisfactory that a member of the Government should attend here to day I think on the contrary it is very necessary that members of the Government should keep themselves closely in touch with the ever developing movement of which you are the trustees and for which in the past you have done so much I am old enough to remember the first non stop run of motor cars from the Metropole Hotel London to the Metropole Hotel Brighton that hazardous adventure comparable if not to flying the Atlantic at least to swimming the Channel—(laughter)—as it seemed to us in those days Although I did not witness the arrival of the cortege—(renewed laughter)—I was at least privileged to observe its departure and I have heard from eye witnesses of the reverent admiration with which the very few vehicles which had actually gone at a speed of I suppose about 15 miles an hour without stopping once from London to Brighton were received Throwing one s memory back a little further but still within the recollection of all but the fortunately young in our midst one can still recall the days in which a prudent Legislature provided that every mechanically propelled vehicle should be preceded by a middle aged man carrying a red flag We have advanced a great deal since those days and any man would in my judgment be very short sighted indeed if he assigned limits to the development of what is one of the most remarkable discoveries of our lifetime We have become so familiar with the congestion of our streets by motor vehicles to day that it is almost impossible

to throw our minds back to the days when [illegible]
or your hotel in London, and when no in [illegible]
could be seen except one that was drawn by [illegible]
has been the change that it requires an ef[illegible]
self back into that world. How can one il[illegible]
as well in this way as in any other. In [illegible]
detective romance which has surrounded the [illegible]
Sherlock Holmes as Conan Doyle created [illegible]
mention, and there could have been no m[illegible]
and whenever that gifted detective was in [illegible]
motion he discarded what in those days was [illegible]
favour of a hansom cab.

The particular subject of your discussion to[illegible]
ment of facilities for international travel by [illegible]
the speakers will be in the least embarrassed [illegible]
the topic for, indeed I know of few asp[illegible]
port problem which would more easily adm[illegible]
the various authorities of the world would, I [illegible]
Imperially but would think cosmopolitan[illegible]
which ought to be so easy but which is in [illegible]
as that of taking a motor car abroad. The [illegible]
cal proximity of England to the great con[illegible]
ought surely, if common sense were bro[illegible]
problem to have made it as easy to take [illegible]
Channel for the purposes of a Continenta[illegible]
car from England to Ireland. I [illegible]
Scotland because of course there [illegible]
sea journey in the case of Ireland, [illegible]
case of the Continent. To make th[illegible]
and informal however involves a great [illegible]
is an advantage to the Englishman who [illegible]
Continent it is to the advantage of for[illegible]
should make it easy for Englishmen to enj[illegible]
foreign surroundings, and if one may [illegible]
spend their money on agreeable holidays [illegible]
formality as to make the whole thing [illegible]
doing. I have had occasion to take [illegible]
more than once recently, and I have n[illegible]
barrassed myself because there are certain [illegible]
making these processes at once more rapid [illegible]
(laughter)—but I know perfectly well the m[illegible]
many of my private friends have been [illegible]
realise of course, that there are condition[illegible]
observed. For instance, if a country is hig[illegible]
matter of the motor car industry it would, [illegible]
unreasonable that, except under adequate g[illegible]
be possible to take in a car on a tourist ba[illegible]
commercial disposition of it in a country [illegible]
touring.

I experienced the inconvenience of the cert[illegible]

summer when I took the humble boat which occasionally when weather permits up the Seine to Paris l by an even smaller yac dy who had sold it on th terrible thing that an English yacht should have been sold in ice and I was consequently compelled to sign I know not how many papers wherever I stopped wherever I met a Customs official promising and pledging myself that in no circumstances however tempted would I sell this yacht I rather resented the formality because in the whole course of my journey I did not meet any man of any nationality who showed the slightest desire to purchase the vessel (Laughter) Surely it should be perfectly easy for a responsible national body in each country to give a guarantee that whenever a traveller goes to any other country with his motor car he will bring that car back to his own country That ought not to be an individual re is given enough influence it will join that body because of the to give, and if they all join they can be bound by rules an penalties In fact it should be the easiest thing in the world to organise a system under which Customs conditions do not present themselves as in any way irksome

In the second place I have often thought it ought to be the easiest thing in the world to adopt some standardised system of the signposting of roads That ought to be the same all over Europe After all the countries are close enough together the are obvious enough to make it absurd that there rent methods of giving warning I am sure that if the organising is Congress would devote itself to that subject it would attain very valuable results

I myself can only deal with one further topic and I am conscious that it is a more difficult one but I believe however that at some time or other the reform will be adopted of introducing uniformity in the rule of the road It does really seem to me to be absurd that when one crosses that narrow belt of water between this country and France the driver of a car must immediately revolutionise all his instinctive conceptions of what it is right to do in a moment of emergency Believe me there is some element of danger in the discordancy of rule which exists to day It is not that a man does not remember normally which side of the road he ought to follow in the country in which he is driving That is not the danger The danger occurs when unexpectedly perhaps when rounding a corner some swift and sudden crisis arises calling for immediate action and it is then that eight men out of ten will revert intuitively to what is their customary and lifelong practice I am not saying which country ought to give way—(laughter)—upon this point but as I am quite incapable of driving a car myself I shall at least be excused

of having any strong personal bias in the matter It is a matter or utter indifference to me so long as time is given to my chauffeur to acquaint himself with any change that is proposed whether we pursue the right hand or the left hand course when driving our motor cars I do not think it is very creditable to the statecraft of the motor world or if I may say so with the greatest possible civility of your own Congress that you have not made more progress in dealing with this problem in examining it and in deciding whether or not it is a problem which is beset with too much prejudice for its solution I myself think that if approached in the reasonable spirit which I know has marked and will continue to mark your proceedings you might make a con tribution which in my judgment would be of the highest possible value to all those who drive motor cars in countries other than their own

I have made a number of suggestions a thing which I greatly dislike doing on subjects which I imperfectly understand but such reflections as I have made have occurred to the mind of one who although he does not drive a car has very frequently occa sion to be propelled by the exertions and the skill of others It so happens that I have a Bill of some importance to introduce into the House of Lords this afternoon and I hope therefore that this company you in particular Mr ude ness to you if I ε nim portant observations to leave you

The CHAIRMAN I am sure I am interpreting aright the wishes of our assembly in presenting to Lord Birkenhead our compli ments and thanks for his remarkable speech by which he honoured our mutual work He has dealt in a high spirit and in excellent terms with the philosophy and the general aim of the great cause which is ours that of universal action and the main tenance of international relations

(Lord Birkenhead then withdrew)

The CHAIRMAN We have three papers before us dealing with the various aspects of the subject on the agenda I will call on Mr Stenson Cooke to introduce the paper of the Alliance Internationale de Tourisme

Mr STENSON COOKE (Member of the Executive of the Alliance Internationale de Tourisme and Secretary of the Automobile Association of Great Britain) introducing the paper submitted on behalf of the Alliance Internationale de Tourisme (see Section II) said May I say first how grateful I am to my dis tinguished friend M Lachenal for having consented at a few hours notice to preside this afternoon in the regretted absence of Mr McWhirter Nothing to my mind can more effectively indicate the essentially fraternal atmosphere of this great Con gress Secondly may I in the regretted absence of Lord Birkenhead pay my humble tribute to the genius of that statesman in that he gave an incomparably accurate synopsis

of the paper which I have written but which he could not possibly have read It embarrasses me because most of the subjects upon which I have dwelt were touched upon by him with that remarkable touch of his and this fact makes me appear to you almost redundant However delegates will I might devoutly hope have seen the paper I must not waste time by repeating it in detail but there are points in it I would like to emphasise before it is discussed The paper deals with international touring both from the historical aspect of things accomplished and also from the point of view of that which remains to be achieved Not all the delegates present can be expected to be concerned with touring but all I am sure are interested in it Motoring from being the sport of the early few has become the relaxation of the multitude Our concern is to make that relaxation as complete as possible to remove difficulties in short to simplify touring

In my paper I trace the progress made since the birth of the triptyque in 1909 discussing chiefly the European aspect of international touring That is not inappropriate Europe presents an extraordinary problem with its network of frontiers and because it is the happy hunting ground of the world s tourists I would draw special attention to certain questions discussed in the second part of the paper which still await attention and I think deserve your consideration The extension of the triptyque and of the international travelling pass are worth working for so that touring from being merely international—in the European sense—may develop on inter continental lines Then there is the question of road signs and traffic signals I venture to suggest this Congress might agree that these should be uniform in character The attainment of that ideal will aid the development of international touring by removing yet another of the difficulties of the motorist Then the passport and the visa Is the visa necessary? Can the passport be simplified? Many countries have abolished the visa I propose that this Congress should resolve that this good idea ought to be adopted by all other countries

The question of the rule of the road—whether we should drive to the left or to the right—is intriguing For myself I would raise my voice in favour of leaving matters as they are for the present but I feel that when the time comes—this is a confession—those countries which drive to the left such as Britain and the score of others which still do the same will have to give up their rule even though it be the older rule in favour of the more popular The great expense involved in making the change renders it necessary that it be postponed until the financial difficulties of the world have been ameliorated Tax concessions for tourists I suggest should be general It is not profitable to attempt to make the tourist pay for the privilege of entering the country in which he proposes to spend his money This is a subject on which this Congress may desire to express an opinion

In drawing your attention in particular to these points my

conclusion is that this Congress has the opportunity as it has the will materially to advance the work of motor tourist development by adopting a resolution based upon them This is a gathering of practical men and the business this afternoon is concerned with traffic which circulates hundreds of millions of pounds sterling around the world Your friendly discussion of how to aid this traffic will be of benefit to the Alliance Internationale de Tourisme in its labours to that end I beg formally to move the following resolution —

The World Motor Transport Congress representative of sixty two nations in session in London to day places on record its considered opinion that the development of international touring should be encouraged by all means possible in the interests of international amity and that to this end delegates should urge upon their respective Governments the importance of (1) simplifying the passport formalities (2) abolishing the passport visa where this has not yet been done (3) broadening the regime of the Customs Triptyque the Carnet de Passages en Douanes and the International Travelling Pass (Certificat Internationale de Route), (4) the exemption of touring visitors for short periods from motor taxation on a reciprocal basis and (5) the standardisation of road signs and traffic signals

Mr MERVYN O GORMAN C B D Sc (Vice President of the Association Internationale des Automobile Clubs Reconnus and Vice Chairman of the Royal Automobile Club) introducing his paper on Road Traffic Congestion and other Problems submitted on behalf of the Royal Automobile Club (see Section II) said It occurred to me when I was asked to read a paper on international travel that there is something which interferes with all travel so gravely that it is worth considering whether there are any solutions for it That problem is congestion The rate at *which goods traffic travels is slow even nationally but it is* particularly slow internationally

To begin with no experiment has been made by any Government to discover what is the manner of flow of vehicles along roads which results in the maximum of traffic being carried by those roads Nobody knows to day what are the conditions which enable a road to do its full duty There is no machine in other industries in respect of which the designer the owner the manufacturer the industrialist or the workman or somebody does not know what are the conditions in which it will achieve its

I have done both and have been punished for exceeding both Then we were told to go no more than 20 miles an hour All those regulations were made but there were no observations made as to whether the traffic flow was affected by those regulations favourably or unfavourably Internationally we desire that the experiment should be made but only by those who

qualified to do it of discovering what is the maximum carrying capacity of roads In the course of the paper I have ventured to suggest that there is a solution and I put that before you first This is a subject of common interest to us all I will ask you to suppose that you have a circular road $\frac{1}{4}$ mile long and wide enough for one vehicle to put on that road one vehicle —a good one—and have it *propelled round that road all day at* 30 miles an hour It can do it of course If you increase the number of vehicles—again all good ones and of the same type—until there is a continuous sequence of vehicles nose to tail all the way round and give the order for them to proceed at 30 miles an hour, how fast will they go? You all know They will go at four miles per hour They are capable of going at 40 miles per hour and the drivers want to go at that speed Nobody has broken down and there is no blockage Why therefore do they go at only four miles an hour? That is the problem If you take away every alternate vehicle so that instead of say in a space of a quarter of a mile there being 110 vehicles there are now only 55 and if you tell all the drivers to drive carefully *each of them to maintain a distance of one vehicle length between* his vehicle and the next one at what rate will they drive? I have been down the Portsmouth Road and other roads which on Sundays have different degrees of traffic density and when the vehicles are spaced one vehicle length from one another the speed at which they travel is 15 miles per hour Therefore my circuit of vehicles on the circular road which previously could travel at only 4 miles per hour begins to travel at 15 miles per hour when half the vehicles have been taken away

That does not interest you a bit but it will when I point out this that if you draw a line across the road and count the tonnage of vehicles that passes in a given time you will find that when the road is packed with vehicles nose to tail the tonnage that passes in an hour is X but when you have taken away half the vehicles so that there is a space of one vehicle length between each the tonnage that passes is two and a half times more than X Therefore you have increased the carrying capacity of that road by 250 per cent by taking away a sufficient *number of vehicles to leave a gap between each of those* on the road Appendix II of the paper gives the mathematics of maximum flow As a matter of fact it is almost elementary algebra but the physical explanation is that no man will drive so close to an obstacle which may stop that he has no chance of

as a basis I arrive at precisely the result I have found on the Portsmouth Road namely that a speed of about 14 miles per

hour will be attained if there is a spacing of a vehicle length between each vehicle That is the basis on which I suggest an experiment should be made I do not say that you would increase the traffic flow of Piccadilly two and a half times in that way because there are confluent roads vehicles that break down pedestrians who hesitate and who must be respected but experiment is essential before you make big expenditures to cure congestion

I pass from that to another general subject which I deal with in the paper—and I am very pleased to see here Mr Piggott (of the Ministry of Transport) whom I respect so much and who has so much interest in these things from a Governmental point of view—and that is the question of the duties which I consider and which I hope to persuade you all to consider are the duties of a Government in relation to traffic I consider there are four such duties namely (a) to help as best possible all units of traffic to their destination (b) to provide them with every safeguard as they go (c) to arrange for an economic return for road expenditure and (d) to provide for raising funds justly to meet road expenditure Those four objectives sound so harmless that they are almost platitudinous but oddly enough—and I say it with all due deference—none of the sixty odd Governments represented here seem to have had those objects in view according to their legislation for the conduct of traffic

In the days before the motor car the local performances of the butcher s van and the farmer s cart conveying goods from the farm to a neighbouring market were dominant factors in the distribution of the control of road administration and it resulted in local administration of the roads To day however farmers send goods by road over distances as great as that from Nottingham to London Many of us are tourists who travel long journeys by roads We can hardly move without crossing the areas of a hundred or two or three hundred road authorities An ingenious device was brought out in England I shall not call it bribery but anyhow there is a central fund which is duly applied to the 1 300 road authorities in England and we thus purchase a sort of modified unanimity in some of the things they do But that is not what we want What is wanted in the great transport industry of the country is a large inclusive Napoleonic view of the business Unfortunately all those little 1 300 road authorities in England—and it is just the same in other countries that I know—differ as to whether they think it would be nice to have *a road made through their district* They can only be persuaded to do so by the country paying something up to 100 per cent They have not a Napoleonic view In fact so difficult is it for the Minister of Transport that I have ventured upon an epigram which I hope he will forgive to the effect that the 1 300 road authorities in England act upon the Minister of Transport in the same way that fleas act upon a dog They prevent

working out and had I worked it out my paper would have been about 80 inches thick instead of $\frac{1}{8}$ inch

There is one other topic which I have very closely at heart and that is the question of roundabout and cross road traffic The cross road traffic introduces the trouble that a number of vehicles must be stopped in order to enable a number of other vehicles to cross in dense places in other places where it is not dense a number do not stop and they collide In either case the matter deserves urgent attention The Royal Automobile Club has had many discussions on the subject of country cross roads and as the outcome of those discussions we have come to the view that the only profitable solution is to use warning signals to advise the public who use them that one road is minor to the other It is up to the people on the minor road to look out and in order that they may know they are on a minor road something must be put up to tell them so This proposal which was made by the Royal Automobile Club on whose behalf I am speaking was made also to the County Surveyors Society by Colonel Sinnott many years ago This view was arrived at on both sides quite independently but it is good to find that we hold the same view Therefore I hope we may be able to persuade our Government to adopt that solution of the country cross road problem In my paper I have dealt with the alternative suggestion made by Mr Stenson Cooke and I am not going to touch upon it now because it would take too long it is a pity that we should differ but we do differ I think he is radically wrong and that my paper shows it

There is one more point on which I am very keen In Appendix III of my paper I have made a suggestion for a code of the road a code of customs which should be observed by people using the road in order that everybody s travel may be facilitated The most important is that the traffic on the road should keep to the left We in England are under the delusion that we keep to the left but we do not It is the custom for us to drive on the top of the road and if another person hoots long enough and if he is big
we move to the left and let
habit we have to develop is
same in other countries onl
right instead of left It must be a habit and not a law to keep to the left it must be a courteous habit In attempting to facilitate the passage of other traffic by keeping to the left you are following a custom or habit very much analogous to the habit which well bred men have of taking their hats off to lady friends That remains a habit although if you are carrying two large Christmas parcels you cannot take your hat off Similarly when driving and when you are passing a side road on your

the road is slippery and muddy on the left and there are pedestrians whom you will splash if you keep to the left you spare those pedestrians by keeping on the top of the road but when you have passed them you come back again to the left That is why I advocate not a law not a thing with punishments behind it but a habit

I have put down here a number of habits but I say that until we have got an authoritatively agreed code of habits we cannot possibly improve matters Supposing some group of road users has road habits which are rather dangerous As there exists at present no authentic code of what the habits of the road are there is nobody to instruct people how to reform Therefore I ask you and I urge each of you to ask in your own country that your Ministry of Transport or analogous authority shall have the courage—because that is what lacks—to publish what are the habits in your country and in doing that you will eliminate contradictory habits If your Minister says what the habits are then the thing is settled When he has published his schedule of recognised habits or customs you can appeal to him to use his authority with a view to the proper improvement of traffic customs

Herr DIPL ING R FILSER (Allgemeiner Deutscher Automobil Club Munich) speaking in German introduced the paper presented on behalf of that body which paper (see Section II) contained a resolution calling for the general extension of the triptyqe to goods vehicles He said I should like to call attention to the difficulties still prevailing in connection with international motor transport Previous speakers have pointed out the positive results which have been achieved in regard to tourist traffic Some progress has been made in the case of international tourist traffic but the question of the international transport of goods in motor vehicles has been sadly neglected There are still barriers of prejudice which must be overcome It is maintained by some that competition with the railways would arise that the local carriers businesses would be endangered and that the temporary importation of a truck would be difficult to control and these matters must be discussed Even touring cars carrying samples of goods are not afforded the same facilities as are afforded the ordinary touring car The direct advantages of transport across frontiers are overlooked Loading and unloading on the frontiers would be done away with and this is an economic point of supreme importance In consideration of these matters the Allgemeiner Deutscher Automobil Club asks you to give your attention to "   "
it a point of discussion Yo
Congress and will enhance its
with which international mot

Mr HORACE WYATT (Organiser of the Conference) I feel that it is not really my place to rise during this Congress but I do so

only because I feel there is something very much in the nature of a point of order involved in the resolution proposed on behalf of the Allgemeiner Deutscher Automobil Club The resolution suggests that this Congress should request the Ministries of Transport of certain countries to advocate certain changes in the law I feel that we shall be in a very difficult position if we attempt to vote on that resolution as a Congress for the reason that we have representatives here of the Ministry of Transport *and of other Government Departments* of Great Britain and the Ministries of Transport and other Government Departments of some fifty other countries I should like the opinion of delegates on the point that we cannot ask the official delegates of Governments to pledge themselves to press their own Governments in favour of a policy on which they have received no instructions in advance officially It seems to me equally that the representatives of Governments who are asked to bring pressure to bear indirectly on other Governments would consider that in voting for such a suggestion they were guilty of impertinence Therefore I suggest with all due deference that as a Congress we cannot vote on the resolution which is put before us but that we should do something on these lines that is to say, we should pass a resolution to the effect that this Congress appreciates the importance of the resolution moved by the Allgemeiner Deutscher Automobil Club and directs that the [illegible] of the resolution be forwarded to the Association Internationale des Automobile Clubs Reconnus and the Alliance Internationale de Tourisme with the request that the resolution shall receive the fullest possible consideration and that if those bodies feel justified in giving the resolution their support it shall [illegible] the Governments concerned

The Chairman *Perhaps Herr Filser would care to alter his* [illegible] in accordance with the suggestion of Mr Wyatt

(At a later stage it was announced by the Chairman that Herr [illegible] postponed discussion of his resolution until the afternoon of Wednesday November 16th)

Senor Don [illegible] Navarro de Palencia (representing the Spanish Government) I think it might help in discussing the general problem of international touring if I try to make clear the conditions as to road traffic and general regulations in Spain It is not my intention [illegible] but I want to say first that the [illegible] because Spain [illegible] ance in Spain [illegible] country with [illegible] we grow bananas but we also have winter sports Generally speaking however the condition of the roads ranges from good to very good Lately tourists from France have come into Spain and the condition of the Spanish roads seems to astonish them

In Spain in the past the regulations in regard to traffic has varied so much so that up to three years ago we had two different rulings regarding the side of the road on which one should drive We kept to the left in one part and in another

we kept to the right We have abolished that variation, however, and have established a regulation that drivers must keep to the right in order to conform with the rules in other countries The signposts conform generally to the rules established in France We not only indicate the directions of the towns but the mileage also I want to impress upon you the fact that visitors to Spain are very welcome we are thankful to visitors to whom we give all sorts of facilities and we are willing to fall in with any suggestion leading to the simplification of international travelling facilities Finally I want to urge you not to be distrustful about the willingness of the Spanish population to help a visitor and you make take it from me that our women do not — [illegible] (Laughter)

wh

prc,

Mr H H Piggott (Assistant Secretary Ministry of Transport) May I begin by saying how appropriate it seems to me to have M Lachenal presiding at our conference this afternoon he is a representatives of the great Republic of Switzerland, the home of the League of Nations where so many important international conferences have been held I feel I am entitled to speak on an occasion of this sort because I was the representative of Great Britain at a conference held in Paris in October last for the amendment of the International Convention for the Circulation of Motor Vehicles We spent a number of days on the Convention and I and the representatives of 40 other nations had the privilege of signing that document There are two main points of improvement First the new Convention is not limited merely to international tourism but it extends definitely to commercial vehicles and there to a certain extent it meets the point so ably put by Herr Filser It provides for the classification of vehicles according to their laden weight

The second point of importance in the International Convention in its amended form is that the International Travelling Pass has been divided into two portions one relating to the vehicle and the other to the driver There is a separate form for the driver so that if a vehicle is taken to a foreign country and for some unexpected reason you have to change the driver it can be done without the extraordinary formalities attaching to the previous Convention That amended Convention has been signed by representatives of 40 or 50 nations and it still awaits ratification I have made enquiries recently at the Foreign Office and I understand that only eight or nine nations have so far signified their preparedness to ratify the Convention It is provided in the Convention that it cannot become operative until twenty of the signatories of the original 1909 Convention have expressed their willingness to ratify

Now therefore I come to a practical suggestion We have here representatives of all the nations in Europe and I suggest

that they go back and exert pressure upon their Governments to express their willingness to ratify the new Convention so that we may have the twenty ratifications that are necessary for bringing the new Convention into force That is one direction in which definite and immediate progress can be made

I should like to say a few words about the interesting proposal of Herr Filser with regard to the extension of the triptyque system and the Carnet de Passages en Douanes to commercial vehicles as well as to touring vehicles As Mr Wyatt has pointed out it is not an easy matter to settle off hand It is more a question of Customs than of legislation It must be an arrangement between individual countries as regards their practice in

done a great deal of valuable work in the past It has before it at the moment the question of the co ordination of all the motor vehicle legislation of the countries of Europe and also the co ordination and simplification of the road signs and warnings I understand that this permanent Sub Committee is to have a meeting in Geneva next week Unfortunately it is too late to get this particular point on the agenda but I propose to instruct Mr Franklin who will represent the Ministry of Transport of Great Britain on that Committee to raise the question whether the time has not come for definite arrangements to be made between the various Customs authorities of the European countries to facilitate the traffic of commercial vehicles as has been done with regard to touring cars

One point touched upon by Mr Stenson Cooke was that of reciprocity with regard to the remission of taxation in various countries On this point perhaps I may be pardoned if I draw attention to the practice in Great Britain Here at any rate we allow any visitor who comes into the country with a motor vehicle to have four months free from any form of taxation No vehicle tax is imposed on his vehicle for that period and although I do not wish to touch a thorny subject I may point out that in Great Britain we have no tax on motor fuel

Mr STENSON COOKE Not yet Sir

Mr PIGGOTT Well there is no tax on motor fuel our tax is entirely a vehicle tax so that when we remit that tax for four months to a foreign visitor we are in fact freeing him of all taxation This Great Britain did in 1920 in the hope that our example might be followed and that it might stimulate the spirit of reciprocity in other countries If anything however some other countries have gone backward rather than forward and Great Britain finds herself perhaps not for the first time in a state of splendid isolation in regard to the remission of taxation to visitors I hope the delegates to this conference will take to heart what Mr Stenson Cooke has said It is of the utmost

importance that we should get the greatest freedom possible for the taking of vehicles from one country to another the relaxation of all vexatious restrictions and as far as possible that international courtesy should be extended from one country to another in regard to the remission of taxation for a brief period whatever it might be perhaps three or four months when a stranger visits a country May I say in conclusion how much I appreciate the opportunity of speaking at this gathering I feel that meetings of this kind are all part of the big movement for increasing the comity of nations mutual good feeling and good fellowship between nations and it is on that spirit after all that the future prosperity of the world depends

Mr A H Sirks O B E (Chief of Police Rotterdam) I do not need to say that I prefer to speak my mother language, but if I try to speak English on this occasion I hope you will consider it an act of politeness towards the country and city whose hospitality we enjoy One of the most important questions in regard to international travel is that of tolls The toll system is a disease and we have to try to find remedies for this disease One of the best remedies might be a road tax That is not the most agreeable remedy from the point of view of owners of motor cars but when we have a road tax the Government—or the Automobile Club as is the case in Italy—will collect a lot of money and with this money they may incorporate the tolls or they could threaten to make other roads so that roads on which tolls are payable will not be used Another remedy is to have a close control of the tolls received I believe that in many cases the money is not spent for the maintenance and improvement of the roads and if we have a sharp control there is a chance that the tolls will be lowered I know of a case in my country where the toll has been lowered 30 per cent We might find a remedy also by studying history Many of the tolls had their origin in the Middle Ages when we had no motor cars, but when motor cars were invented the toll owners said that these vehicles must pay as well as others but that is not right I believe that when we have justice on this matter some of the tolls may disappear especially for motor cars

A second question is that of traffic signals Mr Piggott has already drawn attention to the conference which is to be held and we can only hope that within a few years traffic signals will be uniform throughout the world It is necessary however that we should eliminate all words fr
figures because if we have words
difficulty whereas if we use figures only we can all understand Mr O Gorman has suggested that it is not necessary to have laws of the road I can quite understand the suggestion coming from him because in England you have gentlemen drivers and although in other countries we have many gentlemen drivers we cannot say that each driver is every inch a gentleman (Laughter) Therefore we need laws We might say it is best to have a rule

that they go back and exert pressure upon their Governments to express their willingness to ratify the new Convention so that we may have the twenty ratifications that are necessary for bringing the new Convention into force That is one direction in which definite and immediate progress can be made

I should like to say a few words about the interesting proposal of Herr Filser with regard to the extension of the triptyque system and the Carnet de Passages en Douanes to commercial vehicles as well as to touring vehicles As Mr Wyatt has pointed out it is not an easy matter to settle off hand It is more a question of Customs than of legislation It must be an arrangement between individual countries as regards their practice in relation to Customs and duties levied on incoming motor vehicles I suggest that is eminently a subject which might be remitted to the permanent Sub Committee of the League of Nations which deals with road traffic This permanent Sub Committee has done a great deal of valuable work in the past It has before it at the moment the question of the co ordination of all the motor vehicle legislation of the countries of Europe and also the co ordination and simplification of the road signs and warnings I understand that this permanent Sub Committee is to have a meeting in Geneva next week Unfortunately it is too late to get this particular point on the agenda but I propose to instruct Mr Franklin who will represent the Ministry of Transport of Great Britain on that Committee to raise the question whether the time has not come for definite arrangements to be made between the various Customs authorities of the European countries to facilitate the traffic of commercial vehicles as has been done with regard to touring cars

One point touched upon by Mr Stenson Cooke was that of reciprocity with regard to the remission of taxation in various countries On this point perhaps I may be pardoned if I draw attention to the practice in Great Britain Here at any rate we allow any visitor who comes into the country with a motor vehicle to have four months free from any form of taxation No vehicle tax is imposed on his vehicle for that period and although I do not wish to touch a thorny subject I may point out that in Great Britain we have no tax on motor fuel

Mr STENSON COOKE Not yet Sir

Mr PIGGOTT Well there is no tax on motor fuel our tax is entirely a vehicle tax so that when we remit that tax for four months to a foreign visitor we are in fact freeing him of all taxation This Great Britain did in 1920 in the hope that our example might be followed and that it might stimulate the spirit of reciprocity in other countries If anything however some other countries have gone backward rather than forward and Great Britain finds herself perhaps not for the first time in a state of splendid isolation in regard to the remission of taxation to visitors I hope the delegates to this conference will take to heart what Mr Stenson Cooke has said It is of the utmost

importance that we should get the greatest freedom possible for the taking of vehicles from one country to another, the relaxation of all vexatious restrictions and, as far as possible, that international courtesy should be extended from one country to another in regard to the remission of taxation for a brief period, whatever it might be, perhaps three or four months, when a stranger visits a country May I say in conclusion how much I appreciate the opportunity of speaking at this gathering I feel that meetings of this kind are all part of the big movement for increasing the comity of nations mutual good feeling and good fellowship between nations, and it is on that spirit, after all, that the future prosperity of the world depends

Mr A H SIRKS O B E (Chief of Police, Rotterdam) I do not need to say that I prefer to speak my mother language, but if I try to speak English on this occasion I hope you will consider it an act of politeness towards the country and city whose hospitality we enjoy One of the most important questions in regard to international travel is that of tolls The toll system is a disease and we have to try to find remedies for this disease One of the best remedies might be a road tax That is not the most agreeable remedy from the point of view of owners of motor cars but when we have a road tax the Government—or the Automobile Club as is the case in Italy—will collect a lot of money and with this money they may incorporate the tolls or they could threaten to make other roads so that roads on which tolls are payable will not be used Another remedy is to have a close control of the tolls received I believe that in many cases the money is not spent for the maintenance and improvement of the roads and if we have a sharp control there is a chance that the tolls will be lowered I know of a case in my country where the toll has been lowered 30 per cent We might find a remedy also by studying history Many of the tolls had their origin in the Middle Ages when we had no motor cars, but when motor cars were invented the toll owners said that these vehicles must pay as well as others but that is not right I believe that when we have justice on this matter some of the tolls may disappear especially for motor cars

A second question is that of traffic signals Mr Piggott has already drawn attention to the conference which is to be held, and we can only hope that within a few years traffic signals will be uniform throughout the world It is necessary, however, that we should eliminate all words from traffic signs, and use only figures, because if we have words we shall introduce the language difficulty whereas if we use figures only we can all understand Mr O Gorman has suggested that it is not necessary to have laws of the road I can quite understand the suggestion coming from him because in England you have gentlemen drivers, and

[illegible] drivers, we

[illegible] (Laughter)

[illegible] to have a rule

In Paragraph 8 he says that triptyques were introduced in 1909 for France and other countries and a great impetus given to foreign travel The impetus is all right and even the 1909 may be right for some organisations but all associates of the Automobile Clubs had them as I have stated years earlier Early in 1914 the carnet de passages en douanes or multi-country triptyque was introduced as the lecturer correctly says though he omits that this was done by the Automobile Clubs—the A I —a somewhat ungenerous omission considering that the Royal Automobile Club has for five years handed over batches of triptyques involving the financial guarantee of the Club without charge to Mr Cooke s organisation so as to encourage touring—instead of reserving these manifest advantages to the R A C Associates only and thereby fostering its own membership I excuse this because we are listening to an autobiography An autobiography being the story of oneself by oneself perhaps naturally overlooks the work and successes of others on the principle that —

We are the sweet selected few
May all the rest be damned
There s room enough in Hell for you
We won t have Heaven crammed

Paragraph 9 of the Historical section finds room to praise the A A for originating a scheme whereby a member instead of depositing with the Club the amount of the Customs duties and withdrawing his cash on his return from his tour was allowed to do it more cheaply by substituting securities for cash—by the process of giving his Bankers Indemnity to the A A This had the effect of forcing the R A C to the same procedure in spite of urgent protests Such a scheme could not last—as indeed it did not The scheme was a failure and was withdrawn by Mr Cooke within two years At present a bankers guarantee or an insurance is taken out and paid for by the touring motorist plus a small cash deposit This though better is not a good scheme really Formerly the tourists paid for their touring facilities Now they are given to them in part To make payments to an insurance company is of course good for the insurance company but the money has left the automobile world Meanwhile the Tourist Bureau deprived of adequate sustenance from tourists must still draw their funds from somewhere Since the tourists themselves do not pay enough the non touring motorist members of the Association have to make up the balance which is taken out of their subscriptions

Obviously the international tourists like being partly paid for by the far more numerous and poorer non touring members and the evil system which was as our lecturer says originated by the A A is likely still to remain with us *He is theref* not quite right in saying that the path of the interna motorist has been made progressively easier and I gi above information in compliance with his wish th

deliberations of this Congress may advance the matter ' Robbing Peter to pay Paul is not a sound way of advancing Peter or Paul

The list of countries where Customs are to be negotiated by the "carnet" of the R A C is the following twenty one — Austria, Bulgaria, Belgium, Luxembourg, Czechoslovakia, Denmark, Egypt, Finland, France, Germany, Great Britain, Holland, Hungary, Italy, Norway Latvia, Poland, Roumania, Spain, Sweden and Switzerland, to which will be added in a few months four more—the Irish Free State, Estonia, Lithuania and Greece

In the twelve countries (Spain, Tunisia Portugal Czecho slovakia, Hungary, Roumania Yugo Slavia, Latvia, Bulgaria, Poland, Finland and Egypt) where the A A has not got "carnets" or triptyques the R A C will assuredly continue to provide them with triptyques as heretofore without charge and whenever we can

As regards paragraph 11 the International Travelling Pass was obtained for motorists in 1910 nine years before the A I T was *born, as a result of the efforts of the Clubs of the A I and those* who helped them When I read this historical essay so far I ceased to expect to find any record of the doings of the A I clubs but in paragraph 13 I find that the R A C and its affiliate the Royal Scottish Automobile Club administer this Pass for Britain This act of gallantry is hereby acknowledged, and also thanks for mentioning the defunct L I A T which we are told was shattered—by some shell—in the war

The division of the Travelling Pass into two parts—one for the driver and one for the vehicle—was years ago advocated by the R A C Touring Department, and perhaps also by the A I T Of that I have no information at present One notes in the last paragraph of the Historical section that the A I T has ' above all a moral role This is very good news It should result in a more accurate History next time

Turning to improvements I am happy to be able to announce that the Carnet of the A I has a considerable increase of countries to day It may be interesting to know that the R A C were first in the field with the first ship to carry uncrated cars as baggage and though the lecturer surely knows the fact, he omits that the R A C maintains a special staff at the prin cipal ports to receive motorists I am glad that the A A also does this

I agree that the universal acceptance at the 1926 Diplomatic Conference of Governments of the triangle as a danger symbol was a valuable achievement A warning in the national languare is inferior to an agreed symbol because every tourist does not know every language This was proposed and carried on the motion of the A I instigated thereto by the R A C and the four north European Clubs after a discussion with the A I T which, no doubt owing to the absence of their A A representa

tive, had no such idea and did not mention it

As regards hand signals and police signals, I am glad to be able to report that the last two meetings of the A I , the R A C , with the support of the Swiss Automobile and other Clubs whose countries had sent their police to London to study British methods, prevailed on the A I to adopt the British signals so closely that no difference would be observed in practice, and this recommendation is already on its way

I have every hope that the A I T will be able to join the A I , and so increase our number as to get by unanimity what we desire Here there is a practical case where Mr Stenson Cooke s offer of co operation is accepted

For some years past customs facilities for camping equipment, trailers, wireless sets and charabancs on tour have been under discussion at the A I , and I see from this paper also by the A I T , in all such matters of course the two bodies should work together. I learn also from this paper that the A I T is preparing in Switzerland what the A I has been preparing in Switzerland—International Touring Maps—and I am due in Paris on November 19th at the A I Committee to hasten this In case it is of any use to the A I T for inspiring further activities on their part I can mention that the A I is also preparing itineraries of the principal routes in all the thirty two countries of the A I

In conclusion, let me say that though I have been critical of Mr Stenson Cooke s paper I highly appreciate the value of the A I T I only wish that they were always working together with the A I and that there were no cause except absence of knowledge to explain the omission of any appropriate mention of the Royal Automobile Club or of the A I in a paper which purports to deal with the history and development of international touring facilities

The CHAIRMAN I notice that nobody has opposed Mr Stenson Cooke s resolution

Mr T J KIERNAN (delegate of the Irish Free State Government) When Mr Wyatt spoke about the difficulties of official delegates in regard to making recommendations to their Governments and still more so in regard to making recommendations to other Governments he translated very faithfully what has been in my mind as a real difficulty from the beginning of the Congress We officials when we wish to advise our Governments, have to do so through the proper channels We must advise our political chief and eventually our Minister, who brings the matter before the Executive Council or the Cabinet, but we are debarred from making public recommendations to our own Governments I am glad therefore, that the resolution before us is not a difficult one to amend, and I think it can be amended in such a way that it might be signed by everybody We are asked, in the second part of the resolution, to urge upon our respective Governments the importance of doing various things We cannot exactly do that, however If our Governments have visas at the

present time that is the policy of our Governments, and we cannot dictate to them how they should change their policy I wonder if Mr Stenson Cooke would agree to an amendment—a purely verbal amendment—to the second part of the resolution, so that instead of providing that delegates should urge upon their respective Governments the importance of the five matters dealt with, it will provide that " the following important questions are worthy of the closest attention and examination by all the Governments concerned " The resolution will still include the five points which Mr Stenson Cooke wants to make, but the new wording will avoid forcing us, who are official representatives, from recommending these changes to our Governments While any of the official delegates personally—myself for example—would be in favour of the various points recommended I want it to be understood that technically we could not recommend them In saying this I have no desire to debar the Congress from coming to important resolutions, nor have I any intention to confine it to resolutions which really have nothing in them

I hope the manufacturing and tourist interests will see the difficulties and will realise how perplexing is the question even of the change from the left to the right side of the road—such a big change that even Mr O Gorman would not recommend it You have to remember also that Governments have difficulties in abolishing visas and allowing trucks and lorries to enter their countries unchecked I think one of the great benefits which official delegates to this Congress will derive is that they will stock their minds with extra knowledge they will find out what are the difficulties under which the manufacturers and touring interests are labouring, and the information will be valuable to them later Possibly some question of public importance may come before them and they may be asked to give an opinion, and incidentally I think the advantage in that respect is not confined to the official representatives for I think it is of importance to the manufacturing interests and the touring associations that the official representatives should know what they want done

M PAUL DUCHAINE The remarks made by Mr O'Gorman were infinitely unjust and incorrect If Mr Stenson Cooke made mistakes in his statement Mr O Gorman also made mistakes Moreover, I think this is not a time to enter into such discussions but we should work together and try to push forward the objects for which the various associations have been formed It is true that at the present time the Automobile Club is more or less separated from certain other associations it is also true that I was one of those concerned with the creation of the Touring Club in my country and with the formation of the L I A T , which is [illegible] the world it [illegible] and I was [illegible] historical [illegible]

errors and other little items are really of no value what is of value is co-operation

Mr STENSON COOKE I should like to take the earliest opportunity of apologising to Mr O Gorman for a most unfortunate historical error in a date which was a mere figure but which appeals to one of Mr O Gorman s exacting disposition as of some

concerning the freedom of touring between all the countries of Europe and any other comparatively side issues such as who did which, and who did it and when, do not concern me at the moment

Mr WYATT I will now read the resolution as the representative of the Irish Free State Government proposes it should be amended and I will then ask Mr Stenson Cooke if he will accept the modification The amended resolution is as follows —

The World Motor Transport Congress representative of sixty two nations in session in London to day places on record its considered opinion that the development of international

passport formalities (2) abolishing the passport visa where this has not yet been done (3) broadening the regime of the Customs Triptyque the Carnet de Passages en Douanes and the International Travelling Pass (Certificat Internationale de Route), (4) the exemption of touring visitors for short periods from motor taxation on a reciprocal basis, and (5) the standardisation of road signs and traffic signals

Mr STENSON COOKE I accept that

The CHAIRMAN Does anybody wish to discuss the amendment, or to continue the general discussion? As there is no response I will now declare the discussion closed and will ask you to vote upon the resolution as amended

The amended resolution was carried unanimously

The CHAIRMAN Before the meeting is adjourned may I say how deeply indebted I am to you for your courtesy and for the way in which you have rendered quite easy and agreeable the task of presiding over your assembly The " spirit of Geneva " an atmosphere of good understanding and mutual collaboration has fed our deliberations after a few fugitive shadows, into a very smooth path and I am sure that our efforts for the improvement of international travel and the amelioration of the road traffic problem have been crystallised into something very practical and useful so that we really may have made a great ste towards the solution of these difficult problems

FIFTH SESSION *of the*

World Motor Transport Congress

HELD AT

THE SAVOY HOTEL, LONDON, W.C.1

ON

Wednesday, November 16th, 1927.

MAJOR-GENERAL S. S. LONG, C.B.

(Chairman of the Traffic Committee of the Federation of British Industries President of the Mansion House Association Chairman of the Traders Co ordinating Committee on Railway Matters &c)

in the Chair

Subject of Discussion: "The Necessity for Co-operation between Road and Rail Transport."

The CHAIRMAN We have a subject for discussion this morning which is of unusual interest not only in this country, but in almost all countries of the world except those that are fortunate —and this is a curious thing to say—and whose railway systems are not so highly developed as those in Europe and the United States This subject of the co ordination of rail and highway systems is one of tremendous controversy I suppose most of us have read in our various papers the arguments that are put forward and the claims that are made, and unfortunately, certainly so far as this country is concerned I will not say there is frantic abuse, but there is a very considerable amount of antagonism between the two—the modern child motor transport, and the older rail transport, although after all the latter is not so very old, it is a bare hundred years old I now call on Mr Bacon to open the discussion

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two sections of railroad within two or three miles of each other For that reason we have had to develop highway transportation, in order to cut down the duplication of steam services and to get a much greater flexibility in handling both passengers and goods in these congested districts Also with us highway com petition is probably much greater than it is here We have in our section of the country one motor car for about every four inhabitants which is practically one per family and the pro portion of motor trucks is equally large On the roads paralleling our railroads there is a great traffic density which I have shown by means of a map in the paper Even on some of the smaller roads the traffic is great In one particular example I have taken we

on the railroad The number travelling by highway is many times the number travelling by rail A few years ago we were running six or seven trains a day up and down these railroads and they were fairly well filled but at present we have come down to one train per day because the people want to ride on the highway They have the habit and you cannot break them of it It may be a good habit—we do not know—but we must give the public that form of transportation which they demand The proper way of co ordinating —and that is a word we hear a great deal of without very much in the way of definition—highway and rail service is something which has received a certain amount of experimental examination and the results of our experiments are summarised in these few words —

Wherever the operation of motor buses becomes desirable or necessary they are as far as practicable operated —

(a) As an extension of and in connection with rail service making connections with important trains

(b) Parallel with and as feeders to rail service thus enabling the rail service to be scheduled more rapidly and in consequence to be made more attractive to the public

(c) For the filling of rail schedule intermissions where highway operation is justified but where passenger traffic is too light or goods traffic too heavy to justify gasoline rail cars and where through the operation of the highway service these gaps may be filled and

(d) For a highway service connecting with the rail service so far as practicable between certain populous centres where the railroads handle passenger travel but between which the con struction of new or the improvement in old highways has now created a situation in which the operation of the motor coach offers the only means of regaining former revenues now lost

By paralleling our rail service with motor coaches which some people claimed meant cutting our own throats we have been able to realise great advantages by cutting out local stops for the trains On many lines we have no local trains but only

expresses, and the whole of the local work between the large cities is handled by motor coaches. The passengers are carried by train to the nearest large city and distributed from there by motor coach, with the result that our trains are making much faster schedules than previously. Furthermore, the rails are being cleared of slow passenger traffic, in order to facilitate the movement of goods trains, which is really an important thing, because it is from that source the railroad receives its main revenue Unfortunately for the railroad, the travelling public do not spread themselves over the twenty four hours of the day, it would be very nice for us if they did. They all want to travel at 8 o'clock in the morning and at 4 30 in the afternoon, and between those times there is very little passenger traffic On account of that we are operating steam trains in the morning, and no 'buses at that time, in some places, because it is necessary to keep the peak load away from the highway As soon, however, as the peak has gone we start the motor buses, to carry the traffic in the middle of the day, and we put on trains again for the evening peak

It is surprising to find that people prefer to travel by motor coach even when there is an excellent steam train service available That is true all along our main line, where we have an excellent steam train service for in spite of that a large number of independent motor coach operators were coming in there and handling a large percentage of the business which previously belonged to the railroad They were taking the cream of the traffic We had to take all the peak loads and keep all the reserve equipment, and they had maximum loads on their 'buses all the time They had not to cater for the emergencies, because the emergency traffic was left to the railroad The legal situation was a very important one I will not go into that because I know very little of it but about two

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fact that many of the independent operators have willingly sold out their rights to us at, in some cases, quite nominal prices, they were not making a great deal of money because of their ruinous competition against us We were not making money as we would have liked to have done, because of the necessity for competing with them, but now the matter is working out very satisfactorily I think there are few, if any, objections either from the public or from the other highway 'bus operators We are very friendly with them, and the system seems to be working out to the advantage of the travelling public, of the independent operators who are co-operating with the railroad, and of the railroad itself

There is one other thing I should like to mention and that is the economic radius of operation of the motor truck I do not refer to motor truck operation in the paper, because our own railroad is not operating trucks at the present time but many of

the railroads are beginning to operate trucks in large numbers. I have some statistics of truck operation in our territory Those trucks are carrying a very large proportion of the less-than carload freight, and carrying it for very long distances—surprisingly so Distances of 100 miles are very frequent, but the interesting thing is that the radius of operation is a direct function of the size of the truck A survey covering a period of one year in the State of Connecticut shows that trucks of 1 ton capacity have an average radius of operation—this is not theoretical, but actual statistics on the road—of 15 miles, 2 ton trucks 25 miles, 3 ton trucks, 30 miles, 4 ton trucks, 35 miles, 5 ton trucks, 45 miles, 6 ton trucks, 50 miles, and 7 ton trucks, 60 miles Those are the average mileages for large trucks, and those sizes are being operated in our State There seems to be some doubt as to whether all of these will continue to cover that mileage We know that some of it has been forced upon the truck operators by disadvantageous railroad shipping conditions Possibly, if the railroad develops this a little if there is greater co-ordination and the use of rail shipment, probably, for less than car-load

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Dr Scheu (Director representing the Deutsche Reichsbahn Gesellschaft), presenting the paper on "The Position in Germany," submitted by the delegates of the German State Railway Co, and of the Office for German Railway Motor Traffic (see Section II) said In its communication on this subject the Hauptverwaltung of the German State Railway Co states that the co-operation of railway and highway services is to the advantage of both transportation systems as well as the public Our company has recently resolved to make a greater test in the direction of improved organisation and operation, and the provision of larger financial security for two great motor transport companies in Rhineland and Hesse, so that those companies having obtained greater financial security can increase and improve their rolling stock and thus be able to give better service In co operation with those companies we shall establish a greater number of road motor services to feed the railway stations, to replace railway transportation in congested areas, for the transfer of freight between stations on different railways, and for hire haulage

With regard to this question of the hire of trucks I should point out that many manufacturers and traders use their own trucks for supplying their branches, customers and works directly, and so avoid sending freight by rail, but we are informed that most of them will give up the use of their own trucks if there is a possibility of hiring others Since the test I have mentioned was only recently commenced naturally I can say nothing yet as to its success but it is the greatest test so far made in Germany in connection with the co operation of the two forms of trans-

portation. I hope that at the next Congress I may be able to give you some useful information with regard to it.

Dr Teubner (Managing Director, Office for German Railway Motor Traffic): I am the Commissioner of rail and road transport in Germany, appointed by the German Railways Company, the department being known as "Geschäftsstelle für den Deutschen Eisenbahnkraftwagenverkehr". It has been established to advance and to foster co-operation between road and rail transport, to support both parts of the union in working together, and to prepare and to manage motor road services running in conjunction with the railway. In the contract between the railway and the motor transport companies it is stated that the contractors intend to adapt and to unite the rail and road transports for the public, and the test which Dr Scheuch has referred to is the outcome of that. The German Railways Company will be interested to a greater extent than formerly. We hope the test will provide ample evidence that co-operation is advantageous to the people, the railways and the motor services. We have already informed you as to how the organisation is built up, how many services are running, and how far we have succeeded. In conclusion I should like to say that if any of the delegates should come to Berlin we should be delighted to show them the whole of our organisation and arrangements.

M Maurice Vienne (Touring Club de France), presenting on behalf of the delegates of the French railway undertakings taking part in the Congress the paper on "The Motor Vehicle as an Extension of the Railway" submitted by M A M Pourcel (Chief Engineer of the Paris, Lyon and Mediterranean Railway) (see Section II), said: The paper submitted by M Pourcel gives some particulars as to the organisation arranged between the French railway companies and tourist service. These services have developed very greatly in France and have brought increased prosperity to the railways by stimulating the tourist to visit far-off districts and in consequence to use the railways for long journeys. I will not stress particularly, therefore, the fact that services of this kind benefit the railways as much as they benefit motor transport and aid the development of tourist traffic to districts a long way off, because it is obvious.

Quite another question arises, however, when one comes to consider what we may call "local" motor services which aim at the transport of passengers and goods in the districts already served by railways. Some of these services bring increased traffic which cannot but be viewed in a favourable light by the railway companies, but others, on the contrary, are in direct competition with the railways and either duplicate the services or offer quicker and cheaper transit. Naturally this question has claimed the attention of the railways and they have been led to make certain alterations in their tariffs and to improve their time-tables. It would appear, however, that that is not the

general solution of the problem, for the question is one, particularly in France, of many aspects, which can be solved in different ways, the chief of which is that of friendly agreement To sum up, we are of opinion that it is not at present possible in France to draw up hard and fast rules to deal with this delicate question

M LOIRET (Chief Engineer of Mines representing the French Ministry of Public Works), supporting M Vignon, said The great question is Are railways and motor vehicles to enter into competition, or should they combine forces with a view to improve the transport service? At the present time, when motor transport is taking an ever growing extension such question should prove of special interest

First, as to the competition between the two forms of transport Motor transport frequently diverts passenger and goods traffic from the railways With a growing frequency owners of cars find it more comfortable and less costly—especially when accompanied by a few members of their family—to use their motor vehicle than to travel by train, especially when the journey is to be of some length This, as far as railways are concerned, means a loss of revenue, due note of which should be taken

On the other hand, many are the services rendered by combined motor transport services which have superseded inter-district railway schemes, many departments having already adopted such a solution A combined transport company, La Société Générale des Transports Départementaux having obtained a concession for such service, serve with the fleet of 500 vehicles they own, 10 000 kilometres, or over 6,000 miles of roads and transported six *million passengers in 1926*

Goods deliveries by motor vans compete in a no lesser degree with railways Such services extend sometimes to very long distances either to the suburbs of a town or to districts formerly served by a railway or again from one town to another In Marseilles, for instance a company, l'Auto Traction, which secured a large part of the goods transport in the town itself has, besides extended its service to localities within a radius of about 30 miles of the same In Paris, the Messageries Hachette, who are the newspaper forwarding agents, serve daily all the suburban localities and despatch the morning papers at a sufficiently early hour for them to arrive before the first train leaves for Paris, the zone they serve extending to 50 and even over 60 miles from the capital

In Paris likewise, a number of drapers, such as Les Galeries Lafayette send their goods by motor vans as far as Chartres, Amiens Rouen etc , right up to 90 miles distance The vans of that establishment alone [illegible]
about 12 500 miles each

similar door to door delivery service for the same clientele One works it all through by motor vans whilst the other groups the goods by truck loads and transports them by rail

A regular service over a longer distance is organised during the summer holiday season between Paris Deauville and Cabourg this covers a distance of 240 kilometres (150 miles) The whole of such traffic is lost to the railways and the competition with the latter is all the more serious as the delivery by motor vans saves the sender and the consignee the trouble of the cartage to and from stations and the handling of the goods

Judging by these few examples, it would then appear that

as an auxiliary of whose services it would be to their advantage to avail themselves It is really a fact that cases where motor and rail may be of mutual help to one another are actually more numerous than those in which they stand as competitors

Turning now to a consideration of the question of a normal status between motor and rail transport i e co operation and dealing first with the service to and from stations and the link between railway lines in the first place it is with regard to the service to and from stations that motor vehicles form a useful complement to railways In large cities motor van deliveries are frequently organised by the railway companies themselves or is under their control In Paris for instance the P L M the Paris Orleans and the Nord entrust the task to a contractor who performs it by means of motor lorries or tractors and trailers

In the provinces not only are motor vehicles financed in some cases by the railway companies being substituted for horses but the motor services link neighbouring lines together and set between the existing railway lines a close mesh of local inter communication services which are daily becoming of greater importance to the advantage of both passengers and railways

The assistance lent by motor transport to railways assumes various forms in some particular cases For instance and as is shown in the case of the P L M between Bollène and Avignon motor vehicles duplicate at certain hours congested lines on which the constant running of fast and express trains would not permit the running of slow trains to the neighbouring localities

In other places it ensures early or late connections which are not sufficiently important to warrant the running of a special train this occurs on the line from Busseau to Felletin on the Paris Orleans system for the connection with the Bordeaux Geneva main line service It is however owing to the organisation of motor services running through touring regions where railways can penetrate only with difficulty that French railway companies have had recourse during the last few years to motor transport on a large scale For mountainous regions more particularly such services have lately assumed a tremendous

development the most interesting haunts viz the Alps the Pyrenees the Jura and the Vosges have thus become easy of access In the same way motor services are run through Brittany and the Ardennes and convey visitors to the castles on the Loire and in the Paris region to the Forest of Fontainebleau or the Chevreuse valley

Not only are excursions organised and run to places within the radius of railway stations where the interest of both railway companies and motor contractors coincide but the former have not been afraid of extending such services over larger areas It is thus possible and that without leaving the car to go by the Alps route and those of the Jura and the Vosges from Nancy to Belfort Strasbourg and push further along the Eastern frontier

Moreover all the railway companies have followed such lead and have organised similar services in conjunction with their system or have combined their resources with those of neighbouring companies so as to cover longer distances The P L M which took this initiative a number of years ago has thus provided a road service which covers 10 000 kilometres (6 250 miles) a greater distance indeed than that of its own railway system and the 150 to 200 road services thus instituted transported over 250 000 passengers during 1926

In the Colonies motor transport forestalls the railway In places it constitutes a link between two sections already laid of a line which would otherwise remain disjointed It is thus that in Indo China it has become possible to journey from Saigon to Hanoi thanks to a combined rail and motor service although the railway track is far from being completed over an important part of the line In the same way motor vehicles are being temporarily used in place of the branch lines which will ultimately be working such as those which serve the mountain health resort of Dalat close to the Saigon Nha trang line in Indo China

In some cases the motor vehicle penetrates right through regions which are entirely new Such is actually the case in South Algeria the Sahara and the Soudan Thanks to the combined action of the Compagnie Transatlantique and the Algerian State Railways tourists who wish to visit those parts find a whole series of itineraries to choose from which enable them to reach not only the Fouggourt and even the Fimimoun regions but also the Timbouctoo district and the Niger loop through the Fannesrouf desert

If railway and motor vehicle occasionally stand in competition it is however towards an *entente* with motor service contractors that railway companies seem to direct their efforts in France Not only have they shown little apprehension concerning the development of the new system of transport but they have been foremost in taking wide measures for its adoption

It has been realised that motor and rail transport meet requirements that are entirely dissimilar and that they complement each

other Where long distances have to be covered and heavy goods have to be dealt with the railway is alone capable of satisfactorily handling such traffic But the railway cannot penetrate every where, the initial cost of its installation is heavy, and it does not possess the flexibility which is necessitated by the multiple requirements

Motor vehicles possess the very qualifications with which the railways are deficient Wherever there is a road and even—as is proved by experience in the Sahara and the Soudan—where no road exists they can forthwith be called into use Climbing without strain to high altitudes following in all its windings the maze of a picturesque valley stopping at the travellers will in order to allow them to admire a landscape or to view a castle the motor vehicle is a marvellous instrument of tourism and of pene tration through mountainous countries and virgin areas More over it lends itself through the grouping of small parcels at the start and their distribution on arrival to an easy and quick service up to a distance which actually may be put down at 50 kilometres (about 30 miles) normally and occasionally exceed it in districts surrounding a railway station

The boundary line between the two forms of transport is undoubtedly somewhat difficult to trace and some trouble may inevitably arise on that subject Some local railway lines may be doomed finally to become obsolete It may also be that some big systems will have to give up to a certain extent forwarding small parcels over short distances and concentrate on the development of their long distance traffic

Even if private interests however legitimate they be were to run contrary to general interest they should not stand in the way the latter being the only one to be considered In France legislation—although leaving a wide latitude to private enter prise—keeps transport undertakings under State control especially with regard to timetables and tariffs The law extends to subsi dised motor service the same principle as has been applied to railway companies for some time Out of 66 000 kilometres (41 250 miles) regularly covered by motor vehicles in France (urban service excluded) in 1925 41 200 kilometres (25 750 miles) viz two thirds of the total were subsidised either by the State the Departments or communal authorities The total amount of such subsidies exceeded 30 000 000 francs Out of 24 000 000 passengers the subsidised services transported over 20 millions Should it elect to do so the State can override any unjustified opposition coming either from the railway company or motor service contractor when the general interest demands it French companies have realised that all interests concerned may easily be adjusted whilst remaining subordinate to the general interest To attain this end it is only necessary that each party road

on its own ground
competitor railways
mer may offer them

and they have shown no reluctance to lend their own co operation to the development of motor services

They are to be congratulated for having entered that path and for having disregarded a short sighted policy which might any day have been smitten by facts and instead adopted a policy of co operation and union which is the only one likely to ensure their future welfare

Mr G G ELLIOTT (Advisory Engineer to the High Commissioner for the Union of South Africa) submitting the paper on The Development of Government owned Motor Transport Services in South Africa (see Section II) contributed by Sir William Hoy (General Manager of the South African Government Railways and Harbours) said When I was told to attend this Congress I thought it would be advisable to get somebody over from South Africa who had actually handled this branch of the service from its inception but the High Commissioner and Sir William Hoy did not see their way clear to send anybody over and as I was brought up as a locomotive man on the South African Railways they apparently consider that I can represent them I should mention that Sir William Hoy is a man of remarkable activity and force of character and he has made a success of motor transportation so that expenditure and revenue practically balance I notice that several gentlemen representing motor interests in South Africa are attending the Congress and it is very likely that they will be able to give you some more information with regard to the policy of the Government

Our railway lines are somewhere about 12 000 miles long and motor transport covers some 5 000 miles This has been extended very rapidly during the last eighteen months but I can give you very few figures with regard to the cost of handling traffic &c I notice in the General Manager s reports for the years ending March 31st 1925 and 1926 that the net profit of the road motor transport was £1 000 and £1 600 respectively The report for 1927 has not arrived in London yet but it is about

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ciation has been increased from 12½ to 20 per cent Road motor transport by institutions other than the South African Railways has caused a good deal of loss to our railways just as it has in other countries and I do not see how there could be any co operation between road transport services and the Railways Department without some very drastic remedies The public are getting the benefit both in quick deliveries and reduced rates

To give a few instances Some years ago when I was in South Africa Sir William Hoy was informed that a certain steam road transport company was running goods from Johannesburg to

Pretoria in a matter of a few hours—the distance is only about 40 miles—and delivering the goods from the door of the consignor to the door of the consignee I do not see how the railways can compete against this, unless they use a motor rail service to get the traffic across as quickly and cheaply as the motor road service mentioned This road service, I was assured, made a profit of some £200 to £300 per month per lorry, after paying interest and depreciation and all other charges, and the cost of the vehicle, about £1,200, was paid for in a few months In the ordinary course traffic would be handled by the railway from the door of the consignor in Johannesburg to the large goods depot in that town by its cartage department, there it would await its chance of being loaded up when a truck could be obtained, and then wait until the truck was fully loaded, as it is not a paying proposition to run partially loaded trucks It has also to wait for the marshalling arrangements of the train, and when it has left for Pretoria it is sometimes detained at the large junction ten miles away, at Germiston, before it finally proceeds to Pretoria, another thirty five miles away At Pretoria there is a delay in placing the truck in position for off loading at the goods station and in carrying the goods, by our cartage department, to the consignee You will see therefore that this traffic can be handled by motor transport in a matter of two or three hours, whereas on the railway it might take several days, and the cost of haulage by motor transport is less, in spite of the large profits

Motor transport is seriously disturbing the railway administration between Maritzburg and Durban—a distance of seventy miles —and also in the Cape Peninsula between Sea Point and Simons Bay Sir William Hoy, in a recent report stated that on the latter section of the line he is getting all the rubbish, and the motor transport people all the payable goods

There is a brisk rate-war proceeding on the Cape Town-Sea Point line which is about four miles long In September this line which until then was worked by a slow steam service, was opened for electric traction at considerably increased speed A tramway augmented by a bus service of its own, and also by bus services by private owners, has gradually taken away a big portion of the passengers, and in order to regain their patronage the railways have instituted return first-class fares at 3d , for the eight miles and books of first class fares at 2s 6d , as against the tram rates of 4s for twenty-four tickets.

I do not know what the Government has decided to do to get some of the traffic back on other sections, but it seems to me that railways become obsolete in so far as that traffic which has been honourably filched from them is concerned, and the only way I can think of to get over the difficulty is for the Government to nationalise the industry of motor road transport If this were done there would be a very strong protest from all people who have invested money in motor transport, but I do

not think there is much doubt that the public would gain an advantage in quicker delivery and cheaper rates. The Government as a public institution could better afford to have a very big service of lorries and charabancs than any private organisation and it could carry all freight and passengers much cheaper. It is not the policy of the Government to make its public services profiteering institutions, but at the same time it has got to work on business lines so that the losses are not too great, and it would withdraw any motor transport services which involved too large losses.

There are two schools of thought in South Africa, as there are in other countries, as to the relative merits of nationalising industries and public services and running them by private enterprise. It is very often said that Government institutions cannot possibly work on business lines. This is true in a measure, but it must be remembered that in Government institutions such as the railways all the people are represented by Members of Parliament, and it has been the practice in the past for many years for Parliament to appoint Select Committees of the House and special Commissions to enquire into any alleged

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I wonder what the people of Great Britain and the United States of America would say if the Governments of their countries decided to nationalise their railways and transport generally?

In his report, Sir William Hoy states that so far as motor road transport is concerned, he is careful to see that all his services do not run parallel and in competition with the rail services. Of course it is for him to control that, but such is not the case with motor road transport organisations by private enterprises which are a law unto themselves and can institute competing services without considering what losses may be incurred by a railway in consequence.

Motor road transport could be run very much more cheaply if we had cheap petrol. Just to give you a few instances of what fuel costs in South Africa on the railways: our average contract price for coal per ton of 2,000 lbs. at the pit mouth was only 5s. 11d. in 1925 and 5s. 6d. in 1926. This is the only cheap commodity in South Africa. Petrol in 1925 was 18s. 6d., and in 1926 13s. 6d. per case of 8 gallons, and crude oil £5 per ton. I cannot say what the 1927 prices are. For a long time it has been known that oil shales exist, and if those optimists who believe that this industry could be developed on the lines suggested by them are right, petrol would come down to so many pence per gallon instead of 1s. 9d. as now. There are some who think that oil could be produced from our coal economically.

I notice statements in certain publications that Durban has decided to do what Australia has already done, that is, to produce

petrol from crude oil at a refinery and the promoters expect that this will bring the price of petrol down to 1s per gallon None of the prices I have mentioned include carriage—a very considerable item

Steam road services are not popular on the South African Railways because they have boiler troubles some waters are very bad Pumping and coal stations would have also to be provided in outlying places Steam lorries moreover are not so ready for service as internal combustion engine lorries

Supposing the Government decided to take over all road transport the manufacturers would probably benefit because I believe there would be more motor vehicles on the road the agents in South Africa would also benefit but the Government would have to square all those people who have plant running at their own expense

I wish you to consider this suggestion as one of my own as I hold no instructions from the Government to say that this is likely to be their policy I can only suggest one other policy for co operation between road and rail transport and that is for the Government to subsidise private enterprise and allow only such services as are not likely to compete with rail services provided the public does not lose the undoubted advantage of quick delivery and lower rates by road transport The Government should control those rates

Major JAMES PATERSON M C presenting the paper on The Necessity for Co operation Between Road and Rail Transport by himself and Mr J B Osler O B E M I A E submitted on behalf of the Commercial Motor Users Association (see Section II) said In the paper we recall that Great Britain began to develop her industries and had built up a considerable road transport industry as industries went in those days before the advent of the railway and therefore that we have cities and ports which have never been so to speak fitted with railways Consequently when the motor car was invented we developed rapidly under private enterprise road transport systems some of them very considerable in size and with complex organisations We describe in our paper various points in the history of the problem in this country most of those points are merely of domestic interest and we show that the interests of those who have invested their money in railway and road transport industries and also the interests of those who work in these two systems of transport for wages are favoured by co operation We recall that there have been instances in this country in the past of unfettered competition which has done extremely little good to the public and extremely little good to anybody else

We conclude our paper with a question and the answer to it is implied namely that we think the solution of the difficulties in this country is to be found by those engaged in the management We welcome the words used by the Minister of Transport the other day to the effect that a little give and take a little

sound capacity and so on on the part of those engaged in management should be applied and may we add there should be a sincere desire to find an equitable solution We indicate in the paper that by co operation we mean the working together of the minds of men the trying to understand each others points of view Once this is attained we think that progress in eliminating waste and overlapping and substituting for them co ordination of effort will come in this country mostly from the tackling and solving in many places scattered all over the country of many comparatively small and individual problems We indicate certain of them in the paper but there are of course many more than those we have indicated Perhaps I may be permitted to add that we do welcome such papers as we have heard at this Congress because all of them although they do not perhaps indicate the precise solution suitable to this co ctions and will be

ilway of India)

I ng this Congress as a delegate of the Government of India Railway Department That Railway Department the Railway Board directly controls some 15 000 miles of State worked railway and has certain statutory powers over the rest of the 40 000 mile system of the country India is a very large country and it is very dangerous to generalise about it For instance I am told that in India there are 70 different languages spoken though personally I have come across only about a dozen of them Therefore in my remarks I shall refer specially to my own sphere the North Western Railway This covers an area rather bigger than the British Isles and in parts this area is very densely populated on the whole it is not highly developed but is on the way to being developed I would also mention that I feel very diffident about putting the railway point of view before a gathering of this sort consisting essentially of motor interests In one of the papers I read that not only is modern road transport flexible but so also are the minds of the men engaged in it (Laughter) Though I am a keen motorist myself I have been a railway man for a little over a quarter of a century and am the son of a railway man so that my audience will not credit me I know with their flexibility of mind! My reason however for asking permission to address this gathering is that the problem of the improvement of communications in India has not only been very thoroughly considered by the Railway Board the various railway administrations the Provincial Governments and the Communications Board but an actual advance has been made in the construction of additional railways and roads to an ambitious programme Possibly therefore I may be able to contribute some points from our experience which may be applicable with modifications to suit other conditions to the circumstances of other countries which are not

highly developed such as Australia Africa and other parts

I propose first of all to deal with the subject which Mr Brackenbury has so aptly termed the bridging of the economic gap between road and rail transport and secondly co operation between road and rail transport You may think it rather curious that we should talk about co operation when you know that one of the political creeds of India is non co operation we are not talking as politicians however but are dealing with far reaching issues from an economic point of view With regard to this question of bridging the economic gap I should mention that in India the railways are very largely State owned and that four of the most important standard gauge railways—the standard a —are State worked their total

The roads are constructed and by funds found either by the District Boards Therefore both of these means of assisting communication are dependent largely upon public funds and consequently it is important that the spheres of these two should not unnecessarily overlap from the point of view of the taxpayer which must also be considered with the point of view of the public user

In dealing with this question of the bridging of the economic gap I think we may take the analogy of a cantilever bridge the railways bu lding out from one abutment and roads from the other with a suspended span between them In some countries I think it will not be possible to bridge this gap solely by rail and motor transport In order to bridge the gap the railways have made a very definite move by starting the construction of a large number of new extensions most of which are what may be called low category lines i e they are not constructed in the first instance on the main line standard but are constructed to a standard sufficient to carry the traffic imme

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One way in which we have been able very largely to reduce the capital cost of railway construction has been to utilise in these new low category railways lighter rails i e 75 lb rails which have been taken from the main lines the main lines having at the same time been renewed with heavier rails generally of 90 lbs That of course is a very great economy and with us it has been possible because the increase of traffic on the main lines has demanded the use of a heavier rail

Again when we first open these new lines we do not ballast them In new embankments a lot of the ballast sinks into the banks and we find it a real economy to use as we can do in our part of the world earth packing instead of expensive ballast for the first few years At points and crossings we often use ashes or something like that We also save by reducing the number of crossing stations to the absolute limit and keeping

them at long intervals until the traffic requires additional stations Signalling is also of the cheapest description

With regard to the reduction of working costs I may point out that we also reduce the staff by reducing the number of crossing stations and we use rail motor steam or petrol coaches and run short quick trains We have a line recently constructed the cost of which has worked out to 57 000 rupees per mile that is equivalent at the present rate of exchange to £4 275 per mile which I think railway men will agree is a very low figure In India our fares are very low they are sometimes claimed to be the lowest in the world I do not know if that is a just claim but third class passengers can travel for something like a farthing per mile If you turn that into a price per ton mile you will see it is somewhere about 4½d and that is a figure with which motor transport I think will find it very difficult to compete

I may mention that in connection with these projects for low category lines we have found that with these very low fares they are not economic propositions with populations of less than 200 per square mile With higher fares of course the population would not need to be so dense A railway has the advantage that if it is a paying railway it will cover both its interest charges and its working expenses which include maintenance but the road in the absence of the objectionable recourse to tolls has a permanent charge for interest and maintenance Therefore inasmuch as in India the Government is directly concerned with both railways and roads it may be financially sounder for them to build a railway which can cover its own working expenses—or can more or less do so—as well as a portion of the interest charges than to build a road in fact the Central Government of India has under its new policy allowed Provincial Governments if they wish to offer guarantees for railways that are not likely to pay on their own merits

With regard to roads there
programme started especially in
One frequently sees Ford vans and
about carrying passengers generally very much overcrowded often bought secondhand and with maintenance and repairs sadly neglected by their impecunious owners Recently I saw demonstrations of the six wheel lorry in India and I feel that from many points of view that will be a very valuable adjunct to transport in that country I have seen it go over very bad ground indeed but I am not aware of the cost per ton mile at which it will operate I think the final bridging of the gap in India or the suspension span of the analogy must be by means of bullock transport We have considered the use of tramways road rails and so on but for one reason or another which I cannot stop to explain these have not found much favour in India

Coming now to the question of co operation between rail and road transport—co operation not only to serve the best interests of road and rail transport, but also to serve the interests of the public—I am authorised to state that the policy of the Government of India Railway Department is to sympathise with the development of road transport in India, as it must in the long run lead to increased railway business by opening up the country As Colonel Hutchinson mentioned yesterday, a Committee has been appointed by the Central Government to investigate the question of road development, and until that has proceeded further it is impossible to say whether any large organisation will be formed to run motor transport, or whether it will be left to private individuals with small capital such as I have mentioned Co operation has been defined variously in some of the papers, but I have also heard another definition, which is " fifty fifty

Mr F C A COVENTRY O B E (Superintendent of Road Transport Great Western Railway) The question of the co ordination of road and rail transport is always rather a difficult one to discuss as it is usually put forward in a misleading way The actual necessity of the road to the railway is first proved, and that is taken as also proving the necessity for the co ordination of the railway with existing and separate road undertakings The first point is a very easy matter to prove, but the second is beset with many difficulties I personally think that the use of the road to the railways is a self evident fact and I cannot conceive any country where that would not be necessary unless there are no railways or no roads or if everyone has a siding in his own back yard I think the railways have thoroughly appreciated the importance of road traffic from the very earliest days I believe that in the case of the Great Western Railway at the commencement the road work was undertaken by separate firms such as Messrs Pickfords and Messrs Bass The latter co ordinated the sale of beer with their road work This was not found satisfactory and about the early thirties the Railway Company undertook its own transport and has been doing so ever since With the advent of motors their road activities were very considerably extended and quite a large number of passenger services were put on I believe that the first road omnibus service to be run in this country to an actual schedule—maintained to the present day—was put on by a railway company

A VOICE The Great Western

Mr COVENTRY Yes Those services are rapidly being extended, and I hope that soon the Great Western Railway at any rate will be in a position to say that they can collect traffic from any part and deliver it anywhere in the area which they cover We are now covering a large number of country districts and go actually on to the farms We are collecting sugar beet actually from the farmer clearing it by road and delivering it by rail to the factories We are in open competition as to prices with everyone and we seem to be giving the farmers

satisfaction which shows that the railways can do road transport

When you come to the second part of the problem that is co ordination with existing and separate undertakings difficulties arise at once In the first place there is no one to negotiate with Even if we could come to some terms with the bigger concerns we should only make those concerns more vulnerable to the competition of the small man How can you control a man who puts down £10 for a motor vehicle on the hire purchase system runs it as long as he likes or as long as he can pay his instalments and then shuts up I do not know From the national point of view the conveyance of long distance traffic by road is wrong It must be a mistake for the heavy traffic to be pushed on to the roads which are already overcrowded and at the same time for the railways to be left possibly without the full amount of traffic which they can work Even to the motor industry I think it is a most serious matter If there is any thing which can make road travel unpleasant to the private owner of a car it is a flood of heavy long vehicles I know many people who say now that they cannot afford a chauffeur and they will not drive themselves because so many of the roads are full of this long distance heavy traffic The passing of a long six wheeler or a vehicle with a trailer at night on a crowded road, with a lot of traffic coming in the opposite direction does not *make one feel inclined to go out again in the dark*

I think that if the road people are going to co ordinate with the rail they have to understand that they have to give up some thing They have established their businesses by taking the cream of the traffic and leaving the skimmed milk or rough traffic to the railways They could not possibly have estab lished those businesses if they had had to undertake all the work but if they come to assist the railways there are many things they will have to face For a passenger bus to act as a feeder to the railway it must come to the station carry luggage, and run at times corresponding to the times of the trains You cannot alter a train on a branch line to suit a bus service because possibly that alteration will affect the railways all over the country

We have come to terms with some of the companies to run their vehicles into our stations but they will meet some trains and not others because the meeting of the other trains would upset their schedules Rail connections mean *waiting time for a* passenger bus Again if a bus serves the railways it means *that it must stand at the station instead of in the* market place, and very often it is liable to lose passengers in that way because the
all day or during t
see them and get ir
are standing at the station and only pass through the market place The luggage question is a very serious one, it adds very largely to maintenance costs

When you come to goods very much the same questions present themselves From the economic point of view of the road man it is desirable to convey the goods by road as far as possible The railway wants him to bring them to the nearest station and to put them on the rail Also the railway wants it absolutely at a time suitable to itself It is no good bringing traffic in the early morning to a station already working possibly on out goods traffic and expect it immediately to unload and clear the lorry It cannot be done I think co ordination can only be brought about by the very closest working with the railways and that working must include both the managerial and the financial interests in the road concern Anything else in my opinion is impossible

Lieut Col L MANTON D S O O B E M Inst T (British War Office) It occurred to me that it might be interesting to give the point of view of one who is neither a railway man nor a road transport man I must preface my remarks by saying that the opinions I express are personal and I have no official instructions As a result of the war we have a definite part of the General Staff which deals with movement It is the Movements Branch of the Q Staff It is immaterial to that branch how movement is effected whether by rail road or by water In other words the Movement Staff is there to co ordinate in actual fact all the various means of transport which may be at our disposal at any time We have realised that all forms of transport obey the same fundamental principles There is essentially and fundamentally no difference between r il tr insport and road transport The railway train is a 500 ton lorry r a 500 seated charabanc It requires however a permanent w iy It has had to provide that permanent way in this country at enormous expense in other countries at less expense but it has to pay for that permanent way Road transport has developed and we have in this case also the necessity for an extremely expensive form of permanent way As the result of its development in this country we have Mr Rees Jeffreys demanding speedways and what amounts to private sidings for

opment of the auto

permanent way is not

Office has pushed an l is

pushing the design of cross country vehicles the 6 wheelers The 6 wheeler seems to go a long way towards solving the problem of transport without permanent way but it has a power unit and when we get to those parts of the world in which power is expensive it does not bridge that economic gap for which we are so indebted to Mr Brackenbury for mentioning

Looked at from our point of view if railways wish to serve the public by not duplicating services which can be done by road it seems to me that they must learn from the road The road is providing something which the public wants I have not seen it defined yet but that something seems to me to

come down to frequency of service simplicity of service and cheapness Col Walton has mentioned that ½d per mile for passengers is about the same as 4½d per ton mile Very simple arithmetic is needed to arrive at the fact that 1d per mile is equal to 1s 6d per ton mile at which rate road transport can operate very profitably I should like to remind you that the economic gap exists not only for us in war time in the shape of wanting some form of transport which requires no power or which requires rather less labour (man power) than the small power unit but also for you in peace time I think the old horse or the animal has been rather forgotten I believe he can supply that power cheaply where petrol is too expensive or where fuel may be non existent I cannot recollect any case of the vehicle behind the horse having been improved Surely it is not beyond human ingenuity to find a vehicle which the horse can draw over black cotton soil in wet weather—to provide in fact some kind of lower gear for the horse? Why should not the vehicle have pneumatic tyres? Why should not there be more axles to his vehicle? I think there is a great deal to be done yet and I think Major Paterson struck the nail on the head when he said that the minds of those engaged in the business of transport are flexible and they should therefore be able to agree I do not think it is necessary for the railways to leave their rails and go out on to the road I think there are sufficient minds connected with the roads But I do think it is necessary for the railway and the road men to meet and I would suggest that it might not be a bad thing if there could be in peace time something corresponding to the War Time Movements Branch of the Staff

Mr R G M A Hro (Manager Motor Road Transport Department Dutch State Railways) The great problem to which any thinking member must turn his attention in the future is how best the railway systems of the world can be co ordinated with road transport These words spoken by Lieut Col Wilfrid Ashley at the opening of this Congress express the reason which brought the Dutch State Railways to organise a limited company for motor road transport working in conjunction with the railways For passenger traffic motor buses will bring passengers to and from the railway stations where possible Motor buses will also take the place of trains on special lines where this is economical and

[illegible]
the goods from houses to goods stations and from goods stations to houses as cheaply as possible We are studying the question also of conveying goods directly from house to house It is proposed in both cases to make one inclusive charge These are, in a few words the intentions of the Dutch State Railways

authorities I should mention particularly that the Dutch State Railways decided it could only achieve successful co ordination between road and rail by establishing a private company co operating with the railways, but at the same time free to develop in its own sphere

Mr E S SHRAPNELL-SMITH, C B E (President, Commercial Motor Users' Association) At a World Motor Transport Congress of this kind it is advisable that in considering so broad a question as the necessity for co operation between road and rail we must remember the variety of circumstances in the various countries For instance, Sir William Hoy points out in his paper that South Africa is a country of huge distances and one feels that there the average railway haul of this country a little over 50 miles if taken by road, would land them nowhere at all It is useless to use a road vehicle to land oneself in the wilds, and it is therefore perfectly evident that in these large areas the aspects of co ordination and co operation in which I have been a believer for many years are very different from what they are in England For example if you travel 50 miles in various of our industrial areas such as Lancashire and Yorkshire, you will run through several large cities with very considerable populations In considering the application to our own country, of co operation between road and rail one has to bear in mind as one factor the great trouble through which this country passed at the time of the general strike a little more than a year ago, when of course if that measure of co operation to which we all give our abstract assent had in fact been practised the strength of the labour unions in the modern world is such that this country must have been indeed very seriously placed—much more *seriously* placed than it was

I certainly give my assent to the German delegate s proposal that co ordination between railway and motor transport is in the interest or can be in the interest—you cannot say exactly ' is ' to day because that co operation scarcely exists—of both means of transport and of the public subject, of course, to the working out of details I assent in principle

I should like to be allowed briefly to refer in detail to

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in the United States, and he proceeded to say on page 7 of his paper, that in twelve months they had run 7 million miles and had carried 4½ million passengers That performance would be looked upon here as quite small I am associated as a director or otherwise, with about 20 undertakings in the Provinces of England, which do a great deal more than that, so that if that is all the service to be given by a railway company over a road mileage of 1,245 miles, it will compare very unfavourably with the requirements of the British public in regard to the provision of road services One other point I feel I might perhaps refer to,

is that Mr Bacon gave also some figures concerning the traffic taken from his railway company by private cars and omnibuses He shows that 88 per cent of the losses were taken by private car traffic and only 12 per cent by buses All of us who own motor cars know how important it is in order to get through our day s engagements to have a car at our disposal and I think that those who use motor buses the poorer members of the community would not like to be ordered to go by rail any more than we would who go by cars

Mr GILBERT S SZLUMPER (General Manager s Assistant Southern Railway) If one looks at the papers which have been read and the remarks which have been made to day they show a trend all over the world away from the direction of co ordination and rather in the direction of the railways themselves entering into the road transport business Mr Coventry has put forward very fairly the reasons why it is necessary for the railways to come in and he has also outlined the difficulties of actually co ordinating with road transport As he said it is possible it may even be desirable for railway companies to enter into working agreements of some type with the larger road haulage companies but there is no protection to either side against irresponsible and mushroom concerns owning from one up to two or three vehicles which may come in and wreck any arrangements which are come to between the larger organisations

I feel that as railway men we have come here as fathers in the matter of transport to learn all the modern methods from our children and also to learn how we can allow them to have their way without unduly upsetting their elders but unless the very few minutes which are now left at the disposal of others are going to be used to put forward some constructive proposals towards that end I am very much afraid I shall go away a disappointed man

Dr S F MAYER London Manager of the Austrian Federal Railways In his address to the Congress on Monday the Minister of Transport of H M Government said that at no distant date whatever Government was in power would be obliged to tackl the problem of co ordination of the great railway systems and road transport with no uncertain hand Co ordination would enable the wasteful competition which now existed to be eliminated and both these industries would be able to carry on successfully if the Government of the day when it went into the problem would pass laws to prevent over lapping and waste

It was nearly the same idea that induced the Austrian Government to prepare a Bill by which it is not only intended to regulate road motor traffic but also to bring about the much desired co ordination of the two important means of transport The more important provisions of this Bill may be summarised as follows —

Everyone who intends conveying passengers or goods by motor between certain places against payment must obtain the per

mission of the proper authorities—Provincial Government or Ministry of Trade and Transport This permission will only be given if the applicant can satisfy the authorities in respect of safety, regularity and efficiency in the working of the proposed service, further if there is a demand for some means of conveyance and if the undertaking does not violate any public interests

The Bill considers it in the public interest to avoid any unsound and non economic competition with existing railways and motor services Before granting the permission the authorities will therefore have to consider whether or not such non economic competition will be brought about

The Bill also provides that the authorities, before granting the permission have to give notice of the application for a new motor transport undertaking to the railways and boat and motor services in the district and to give them an opportunity of expressing their opinion within a certain period

If the new motor line is intended to connect places already served by railway without touching places which are not yet served by the existing transport undertaking but which—from the point of view of traffic—are of importance the existing railways or boat services are given the opportunity of applying themselves for permission to institute the new motor line Such an application must receive preferential consideration

Any granted permission constitutes an obligation for the undertaking to run their services for the prescribed period without interruption and to convey passengers and goods to the full extent of their ability and in accordance with the existing regulations regarding passenger and goods traffic Rates and fares must be constant for all users of the undertaking and reductions are only permitted if they are applicable to everyone under equal conditions The conditions of transport rates and fares and the time tables of motor passenger services are subject to the approval of the authorities

These are the original provisions of the Bill but, owing to protests being received from several quarters they will probably be revised and it is doubtful if the preferential rights given to the railways will be embodied in full in the Act

Whatever the future of the Bill may be it represents a remarkable attempt to bring about a co ordination of the two vital means of transport—railways and road motor transport—and to eliminate as far as possible wasteful and non economic competition which certainly is not in the interest of the community

The papers prepared for to day s discussion show interesting progress achieved in different countries All of them express the desirability of further progress in co ordination and co operation between railways and road motor traffic

I personally do not think that really good results will be obtained as long as the discussion is kept on general lines It would be of great help if the Congress would express a desire that at its next session practical hints and suggestions also are

laid before it with regard to the best and most efficient way of attaining the required co ordination and co operation

Lieut Col A Hacking, D S O, M C (Secretary, Society of Motor Manufacturers and Traders) I rise to submit for your consideration a resolution on the subject under discussion, and in doing so I cannot use better words than those used in the paper submitted by the delegate of the German State Railway Co I beg to move formally —

" That in the opinion of this Congress co operation between railway and motor transport is in the interest of both means of transport and of the public "

As Mr Szlumper has said, it is a principle easy of acceptance but very difficult of application, but I hope he will not go away entirely disappointed, because I feel that the expression of opinion by a Congress
the British Mi
will be in the
development of
and more economic transport for the public Those of you who may have the opportunity of seeing to morrow and on subsequent days the amazing strides which have been made by the manufacturers of the world in the production of road motor transport of all kinds, must appreciate to the full how important it is that the railways, which in the past have been the main form of transportation of the world, should consider how far they, as common carriers of goods and passengers, may make use in some form or another of this form of transport

Mr Coker F Clarkson (Secretary, Society of Automotive Engineers) I have pleasure in seconding that motion On behalf of the Society of Automotive Engineers, of the United States of America, I wish to make it clear that we are much gratified and very thankful to be represented at this gathering of superb purpose It is indicative of the better intelligence and feeling of world wide organisations that can do something about many pressing problems of essentials of transportation We are arrived at a point when the whole transportation service of the world must be reviewed and fundamentals outlined and defined Old methods, never thoroughgoing, are inadequate and passing A central nervous system that will, so far as possible, and increasingly, function effectively must be evolved This system must react in a rational way, so far as may be, throughout the ramifications of our whole immense field of transport operations

The older form of transportation, notably the railroads, have much to learn of economic operation The tradition of the older schools must relax and give way The antiquated methods of horse drawn vehicle operation are about gone Well trained per-
nd maintenance
the engineering
h of automotive
vehicles Much more can and must be done The relation to these

of operation and maintenance engineering is only beginning to b understood Service to the public is the only thing to consider and look forward to There must be standard nomenclature so that those concerned will
be standard cost keeping
operators can be compared
of knowledge of conditions so that what can and should be done can be understood Intelligent statutory provisions and regulations must be outlined and enacted Obviously, the various forms of transport are intimately connected—the water craft the railroads, operated by steam, electricity and internal combustion engines, the motor truck, the tractor, the motor coach and the aircraft

The Society of Automotive Engineers has long been devoted to the solution of the problems involved It has 6,000 members scattered throughout thirty nations of the world We promise our best efforts in any assistance we can render We shall be glad to interchange information with fellow workers wherever located Our organisation is essentially a co operative one Billions of dollars of savings can be made annually in due course by proper procedure and untold increased comfort and happiness rendered to man Hundreds of millions of dollars have for years been saved annually by automotive engineering standards and research work conducted co operatively in the United States This is only a b world wid
way and must b

The resolution

The CHAIRMAN I should like as Chairman, to make my own small contribution as to how co operation in some instances c be effected I might mention that in the case of the firm which I have the honour to belong, we have some 20 or 30 grea depots spread about the country in a number of great cit Each of these depots is established in the railway goods yar Our goods in truck loads each day are sent off to each those depots where they are unloaded and then by means of o own vehicles—a fairly large fleet—the goods are d buted within an area of 40 miles This is a good examp I think of co operation The railways are pleased to have th goods given to them in bulk, and we are pleased because ins of travelling unnecessarily long distances over the roads th vehicles in each of those great cities travel 40 miles covering whole area and delivering into the smallest villages As a res the whole country is linked up by means of the railways and road vehicles working together, and we do not have vehic travelling long distances and wearing out roads, which we do think is a good system

There is one other matter I should like to mention The is possible and feasible, and has been already recommended someone else I understand Years ago in the days of Southern Railway had a system by which they carried meat

Southampton to London This meat was loaded up at the cold storages into horse vehicles drawn to the station the whole vehicle was put on to a railway truck and run to London whipped off the railway truck in London and brought straight to the market without unpacking Why should not our friends the railways provide a similar kind of truck for the road vehicle? It costs a great deal too much money to my mind to run a motor vehicle say 100 miles from London to Birmingham and then to distribute loads, it would be much better if the railways devised some sort of truck by which I can run my motor vehicle to the station then have it conveyed 50, 60, 100 or 200 miles by rail, then whipped off the rail so that the goods can be delivered within a few hours of leaving the starting point

The fifth session then closed

LUNCHEON TO DELEGATES

Col J Sealy Clarke presided at the Luncheon to day at which the principal guest was Lieut Col the Rt Hon Wilfrid Ashley, M P Minister of Transport

The Toasts of "H M The King" and "H R H The Prince of Wales" (President of the Congress) were duly honoured

The Chairman We have with us to day a member of H M Government in the person of Col Wilfrid Ashley, Minister of Transport We also have with us another member of the Government in the person of Sir William Clark, of the Department of Overseas Trade I ought also to mention further that we have with us Mr Victor Gordon representing the Colony of Newfoundland, which has a special significance for the British Empire because not only does Newfoundland prefer still to call itself a Colony, but it is the oldest Colony in the British Empire, and may be said to be the corner stone on which the British Empire overseas was built Col Wilfrid Ashley has kindly honoured us with his presence, and I do not need to remind you that he and his very able staff, including Sir Henry Maybury, are very good friends of the British motor industry Without them we should never sell what we have to sell because they make our roads and keep our roads in good order We all know that tremendous improvements have been made to the roads in England, and if only for the fact that they have been made dust less we owe a debt of gratitude to the Ministry of Transport Many of us remember what the dust was like on the roads in this country a quarter of a century ago It looked white, but when it settled on you it was black This reminds me of a journey which I took with Col Wilfrid Ashley from Bulford Camp 25 years ago We had no wind screen, but we had goggles, and when we arrived in London we were in such a state that our friends were horrified and would not recognise us We looked like white eyed kaffirs! I now have pleasure in asking Col Wilfrid Ashley to

address you and I will conclude by saying that his presence with us for a second time during the Congress is evidence of the great interest which H M Government has taken in it the first that we have ever organised I would also like to ask him kindly to convey to the Government our hearty thanks for the kindly interest which they have displayed in the Congress

Lieut Col The Rt Hon WILFRID ASHLEY M P (Minister of Transport) It has been the very greatest pleasure to me to come here this afternoon I had the honour of meeting you on Monday when you were just beginning your deliberations and I am informed that your discussions have been bright intelligent and I hope fruitful and that much may be expected from what you have learned and discussed during the two days you have been at your work I hope and trust—indeed I am quite sure—that you have mingled pleasure with business and that you have not spent the whole of your evenings discussing the technical subjects which have occupied your daily work I have not the slightest doubt that those of you who have come here for the first time have been impressed with our traffic arrangements in London Although I am largely responsible for certain traffic arrangements I can praise this work without being accused of self praise because my claim is that our London policemen in their management of the traffic and their courtesy to all who appeal to them cannot be equalled anywhere in the world (Hear hear Then there is our omnibus service which I think is as good as any in the world I think everybody will acknowledge that our municipal and company owned trams which have been passing through very difficult times have yet maintained a standard of efficiency especially at the rush hours which largely meets the needs of the community

I hope you will have an opportunity after you have finished your Congress to explore some of our English roads and English towns and villages because I really think they would repay a visit and form a very happy frame to the picture of your stay in London The motor bus in my considered opinion has done more and is doing more to keep people on the land than any legislation ever passed by any Government in this country The motor bus enables the labourer s wife to get to the country town and village to do her shopping and to obtain a little recreation which she sadly needs The country people are enabled to go to the cinema and see their friends and this removes that sense of isolation which compels so many people against their better judgment to crowd into our great towns and make our countryside more and more depopulated

May I appeal to you all not only in this country but overseas in our Dominions and Colonies and in the great nations which you represent to do something to further the ideal which has always been in my mind since I have been connected with the Ministry of Transport namely that it is not necessary because you make a good road or reconstruct a road that it should be

ugly or that the surrounding country should be made hideous by
ads The
know have
The place
for advertisements is in the columns of the newspapers and on hoardings in the great towns where such aids to commerce are not only desirable but quite right but when you see an advertisement of somebody's pills staring you in the face when you are approaching a beautiful village in rural England or going through the New Forest or the moors of Yorkshire it is a crime against the amenities of this country and very stupid indeed because people come to see the beauties of old England and not to see advertisements

May I say that Congresses such as this are in my humble opinion of the greatest use They show perhaps that we in Europe are not quite so effete yet as our American friends sometimes think us We still have some kick in us but we are very glad nevertheless that they have honoured us by coming

very pleased I am that Sir George Beharrell has been at the head of your deliberations as Chairman of your organising Committee His record of service is far too long to be compressed into the compass of a speech or even to appear in Who's Who With his service on the North Eastern his service in the Ministry of Transport his great work at the Admiralty during the war and the present fine work he is doing for Imperial Airways I am sure that you have in your Chairman a very fine specimen of the Englishman and one to whom we all pay tribute Might I say once again how honoured England is to have such a representative assembly of distinguished people coming from overseas and from foreign countries to aid us in the work of this Congress

FINAL SESSION *of the*

World Motor Transport Congress

HELD AT

THE SAVOY HOTEL, LONDON, W.C.1,

ON

Wednesday, November 16th, 1927.

SIR GEORGE BEHARRELL, D.S.O.

(President of the Society of Motor Manufacturers and Traders Ltd)

in the Chair

"A Review of the Work of the Previous Sessions; Consideration of Resolutions arising therefrom; and Proposals tending to Increase the Utility of this and any Future Congress."

The CHAIRMAN I am sorry that for this afternoon's session, which you will remember is not definitely set apart for the consideration of any particular subject, we have been deprived of the presence of Sir Philip Cunliffe Lister, President of the Board of Trade, who had promised to open our proceedings this afternoon, but owing to the exigencies of his Parliamentary duties, it is quite impossible for him to be present As you know, in the case of Cabinet Ministers, duties fall upon them without any notice whatever, and he must be in his place in Parliament this afternoon. We are very fortunate, however, that Sir William Clark, the head of the Department of Overseas Trade, has been

able to come and take Sir Philip's place so that I am quite sure so far as the contribution to the Congress is concerned we *shall not be entirely the losers after all We have no programme,* but we shall devote a little time to try and summarise the business which has already been transacted and the lessons to be learned from it We also shall discuss how future Congresses may be made more useful and helpful

Sir WILLIAM CLARK It is my first duty to express the regret of the President of the Board of Trade that he has been unable to be present this afternoon and he particularly asked me to tell you how very sorry he was at his inability to come Unfortunately at the same time he omitted to impart to me the many informing things which I have no doubt he intended to include in his address, and I am unable to pass them on to you At the same time I imagine that having reached the sixth and last stage of your Congress even in relation to so extensive a subject as *motor transport it is not very likely there is much left which* has not been said before However everybody who addresses this Congress no doubt speaks from some particular standpoint and I should like to say a word or two from the standpoint of trade and the influence of motor transport in its relation to trade

The motor industry itself, as everyone knows, is one of the greatest industries in the world Last year some 25 million vehicles of all kinds were running in the world, which means an enormous output from the factories, and when one comes to tyres, I have no doubt that Sir George Beharrell knows the statistics, and I can quite well imagine that almost astronomical figures are reached We have had an enormous development in the last few years and if one asks oneself what has brought that

inconceivable point The other point has been the advance made in opportunities for the use of cars The more one looks *at the future it does not seem that the manufacturers can do* very much more in reduction of prices, so that we shall have to look more and more to the expansion of opportunities of using cars for the expansion of future consumption We all hope the world will get richer but the people will only buy cars if they can *get their full enjoyment out of them* A man who is hesitating about buying a car will only buy one if, instead of being a source of exasperation and delay and a possible danger, he can use it as a sure means of getting about the city and into the country

When one goes about England and contemplates those great arterial highways which are being driven through England's green and pleasant land, one may wish that they were free of those advertisements, which Col Ashley mentioned at lunch to-day, and that they had not got those concrete posts and rails, and at such frequent intervals the many filling stations,

illustrating qualities of different oil companies products which seem to be based on the plan that you can sell petrol and oil better according to whether the colour of your pump is particularly lurid or not At the same time we have to realise that all this is contributing to the recovery of trade not only in Great Britain but all over the world The motor has re created the roads and the roads in turn are creating further and further demands for cars not only of the pleasure variety but for commercial vehicles and motor buses and making more and more openings for trade

In a great international meeting like this we need not discuss who is going to get the trade due to this development The important point is that there should be world trade and if that comes there is going to be plenty for all of us We admire the enormous operations in the motor car industry which are going on in the United States the motor industry in Europe is also a flourishing institution All this emphasises how enormously important are the matters you have been discussing and I would particularly refer to the discussion you had upon the motor car as an instrument for opening up world resources Nothing is so effective in opening up undeveloped areas as transport Transport is an absolutely essential pre condition in such circumstances and it is in these conditions that motor transport must come in I will not trench upon the difficult question of the relations between railways and road transport because that is far beyond my humble sphere

It is I understand the intention of the Congress at this last meeting to take stock of the discussions which have preceded it and to consider policy and possible developments for the future This has been in some ways an epoch making World Motor Transport Congress for it is the first time I believe that the Congress has met in Europe It has brought together 200 delegates and over 60 countries have been represented It would be impertinent for me to attempt to estimate the Congress s achievement but it is impossible not to be deeply impressed by the wide range of the papers submitted to it and especially by the fact that contributions have been drawn so comprehensively from all quarters of the world Europe the United States Africa Australia India and the Far East have all contributed from their diverse experiences and from the British standpoint it is particularly pleasing to see how many parts of the British Empire have been represented in the papers put before you

There can be no question but that the Congress even before it opened had in it all the makings of success Congresses however like other human institutions must be judged by their results and the crucial question I take it which you will want to consider this afternoon is what is likely to be the outcome of your deliberations? One excellent result at least is bound to follow almost as a matter of course Delegates from all parts of the world interested in the many aspects of your subject matter—

the technical the administrative and so forth—*have met and* become known to each other and doubtless will remain in communication on matters of common interest This is in itself very well worth while as anyone who is familiar with the conference method will know, but you will want something more Where there has been agreement on questions discussed—even where, as must often be the case the agreement is only that the matter in hand should be further explored before the next meeting—you will want to be sure that the interim work will be carried on

I am afraid that I am not very familiar with your organisation, and I am not very clear how far machinery for that purpose exists There are represented here of course, certain permanent institutions but none of them I think, fully covers the work of the Congress as a whole There is, for example, the Permanent International Bureau of Automobile Manufacturers, but it is mainly concerned, I presume, with matters directly affecting the producer And again there is the Alliance Internationale de Tourisme, which is doing such splendid work in the facilitation of international travel by road But as I have said, there does not *seem to be any permanent body which quite covers the whole* sphere of your labours For example, there does not appear to be at present any single international institution where one can obtain comprehensive statistical information relating to motor transport In the United States much work has been done on these lines, and in the Department of Overseas Trade we are frequently being asked for statistics relating to the motor industry, such as the numbers of cars registered in different countries, or, for that matter in local areas within such countries, and, while we are able to obtain some information through our overseas officers, it is clear that it is not generally available I have no doubt that the same difficulty has been found in other countries Obviously what is wanted is authoritative information, assembled *by some central institution and scientifically classified*

I have been wondering whether it might not be worth while for the industry and other bodies interested to set up some permanent organisation which could meet this want It could compile and issue statistics of automobile registration and traffic for all countries of the world, and arising out of its statistical work it would doubtless be led on to concern itself with questions of definition and classification of vehicles, engine ratings and so on It could also be a source of information on such subjects as road signs and traffic signals, and other matters affecting touring Similar international bodies, as you doubtless know, have been set up in connection with other industries A body of this kind would thus have a raison d etre of its own as the repository of information affecting not only the motor industry, but road transport generally, and it would also be available to carry out enquiries into any matters which the Motor Transport C[illegible] might desire to have investigated in the intervals between the meetings Whether other functions could be entru

connection with the Congress I do not know Of course, if any new organisations were set up it would be essential to take precautions against any overlap of activities with existing bodies However, I merely throw out this suggestion very tentatively in case you may care to discuss it—if not in connection with the present Congress, perhaps on some future occasion I am conscious of my temerity in making it, but I am sure you will realise that it is put forward in all diffidence and fully recognising that there may be many difficulties of which I am not aware

The CHAIRMAN We are very indebted to Sir William Clark for his address, and his suggestion for a permanent institution is one which I am sure we shall bear in mind I doubt whether it is a question which is yet ripe for further discussion this after noon, because some of the questions on which he touched are [illegible] but between now [illegible] es for considering [illegible] good will result

Herr DIPL ING R FILSER (Allgemeiner Deutscher Automobil Club), whose resolution presented yesterday afternoon had been modified, presented it in the following form —

"That the World Motor Transport Congress realises the importance of facilitating international motor transport of goods and draws attention of the Government authorities throughout the European countries to the methods prevailing in Belgium, Denmark Germany the Netherlands and Switzerland as being worthy of consideration

The CHAIRMAN This resolution has been re drafted very care fully in view of the objection of certain Government delegates yesterday afternoon to vote upon anything which would force a policy upon their Governments

Senatore CRESPI (President, Royal Automobile Club, Italy) seconded the resolution which was carried unanimously

Senatore CRESPI (President Royal Automobile Club Italy) I have listened with great interest to the remarks that have been made with regard to future Congresses This Congress has been highly successful but we cannot conclude without knowing what we are to do in the future We wish to continue the work through the associations who have charge of the motor industry in the different countries and I think it would be advisable to create a permanent bureau or body which would make a study of the best means for making future Congresses more useful We want to create a tradition about this Congress in the same manner that traditions have been created in regard to other Congresses I remember, for instance the great success of the International Parliamentary Congress of Commerce which has a permanent Bureau in Brussels, and which holds its Congresses in different parts of the world each year I am expecting any moment a reply to my communication with Signor Mussolini suggesting that an invitation should be extended to hold the Congress in Italy next year (Applause) I am President of the Royal

Automobile Club of Italy and have to take charge of any initiative of that nature As President of the R A C of Italy I feel greatly honoured at the invitation to attend this Congress and although I cannot give you a definite invitation at the moment to come to Italy next year I feel sure that the National Government of Italy will be glad to have the next Congress in Rome In the meantime I should like to express my opinion that a permanent bureau for controlling these Congresses in the future should be established

Mr G A HORNEMAN (Member of Executive Federation of Danish Indutsries) In countries where the distribution of goods is largely done by commercial motor vehicles the effect of increased taxation cannot fail to have far reaching importance for the commercial world and the industry engaged in the production of these vehicles In those countries where motor vehicle traffic directly competes with the State as owner and controller of the railways the matter has a double aspect as it is p rhaps not assuming too much that the Government is invested with a desire conscious or semi conscious to impair the ability of commercial motor vehicles to compete with the State Railways

In my country Denmark the development of motor transport has been particularly rapid which can be judged by the fact that Denmark almost heads the list of European countries as regards the ratio of motor vehicles to population viz one to every 42 inhabitants France has one to every 44 Switzerland one to every 75 Sweden one to every 80 and Germany one to every 171 Only Great Britain the United States of America Canada New Zealand and Australia have a larger ratio

The official plea for the imposition of higher taxation is to obtain sufficient funds for road maintenance and road improvements but it is a strange coincidence that highway authorities have been able to reduce expenditure under these headings Until the summer of this year taxation on motor vehicles in Denmark was assessed in accordance with an Act passed in 1921 and which latterly produced an annual revenue of 16 million kroner and this revenue would constantly and automatically have increased as a natural result of the development I have just mentioned However a new Act has been passed enormously increasing motor taxes particularly on commercial vehicles supplemented by a tax on petrol of about 1d per litre (between 4d and 5d per gallon) It is claimed that the basis of actual

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this anticipation must have been based on unreliable estimates because the additional petrol tax is an innovation for which a reliable statistical basis is non existent Calculations made

certain industrial concerns from their own motor statistics show that their burden under the new Act will be increased somewhere about 100 per cent and in extreme case taken at random from the statistics for 235 Ford 1 ton lorries running on roads in bad condition reaches the startling figure of an increase of 150 per cent

The larger type of commercial motor vehicle fitted with solid or semi solid tyres is taxed respectively 50 and 25 per cent higher than vehicles fitted with pneumatic tyres and as the tax has to be paid in advance yearly or half yearly many owners may be compelled to lay up and eventually scrap their vehicles involving loss of their invested capital This result would directly or indirectly favour members of the community owning lower taxed means of transportation and yield a poor reward to *commercial motor transport in general which undoubtedly may* claim to have had a certain social economic importance through competitive influence on rates charged for the distribution of goods

Particularly during the present difficult transitory post war period it is felt to have been unwarrantably heedless of existing conditions to pass an Act increasing taxes on commercial motor vehicles as the taxes on the old scale were in all reason high enough A Committee formed by the Federation of Danish Industries and similar bodies to consider the question expressed the opinion that the Danish Government had not sufficiently con *sidered the* vital importance of commercial motor transport for the general trade and industry of the country and wished to *emphasise the fact* that such a *prime essential in the commercial* and industrial activities of the nation as the cheap transporta *tion of goods* should be relieved of all superfluous and burden *some taxation* Increased taxation is a movement in the wrong *direction* which tallies but poorly with the general demand for *economy* as it directly impedes the efforts of industrial concerns *to diminish* costs One fails too to see any justifiable reason why *practically* the whole of the burden of road maintenance and improvement and even the building of roads *for the next genera tion should be imposed solely on owners of present day motor* cars and commercial vehicles—proportionately more heavy on the latter

In my opinion it cannot be re iterated too often that this type of conveyance is of fundamental economic importance serving not only the manufacturers and merchants who use them in their business but also the consumers who receive the goods i e the community in general I take the liberty to enlist the assistance of the Congress in the matter by moving a resolution to this *effect* —

That the delegates of industry, commerce and motor organi *sations* at this Congress view with grave misgiving the growing tendency of some Governments to obtain revenue by excessive taxation of motor transport vehicles thereby impeding the

natural development of commercial motor transport and favour ing State enterprise

tions and individuals concerned to acilitate by any means within their important industry

The resolution was seconded by a German delegate

The CHAIRMAN That seems to be a resolution to which all who are not connected with Governments in the respective countries can wholeheartedly subscribe—(laughter)—and I do not think it calls for any further debate I do not think it will be fair to ask the representatives of Governments to vote on the resolution and on that account I propose to take the vote of all delegates other than Government representatives

The resolution was carried unanimously

Senatore CRESPI I have great pleasure in informing the Congress that I have received a message from Signor Mussolini through the Italian Minister of Foreign Affairs in London authorising me on behalf of the Italian motor associations supported by the R A C of Italy cordially to invite you to hold your next Congress in Rome (Applause) I therefore propose that the next Congress shall take place in Rome in September 1928

The CHAIRMAN We are very deeply indebted to Senatore Crespi for his hearty invitation to hold the next Congress in Rome I feel it is unnecessary to ask your acceptance of that invitation because your cheers have indicated your appreciation of it (Renewed applause)

Major GEORGE A HARRIS C B E D S O (Ministry of Home Affairs Northern Ireland) I speak as a representative of a Government and whilst I am in sympathy with the proposal that motor vehicles should not be taxed out of existence I want to know in the first place where we are in regard to the cost of road re construction and improvement Two fundamental pro

week one is the need

ng roads and the other

otor and rail traffic I must say frankly that as regards Northern Ireland the traffic has got ahead of us We have not been able to cope with the traffic and I understand from what has been said that the same condition of affairs exists in some other countries That is a position which has to be faced because the roads will have to be built and improved and it is now a question as to who is to bear the cost *It costs from £12 000 to £15 000* per mile to make a good road Is the cost to come from the city authorities the local authorities or is the motorist going to pay for this work? At the present time the cost is shared partly by the local authorities and partly by the city authorities in Northern Ireland but the funds are derived mainly from the motorist The whole question is in what ratio as between the motorist and the general body of ratepayers is the cost of road

development to be shared From this point of view it would be extremely valuable *if those responsible for this Congress could* have prepared for us a statement showing the practice in this respect in all the countries represented on the Congress It is a problem which demands immediate attention and I would ask that the Organiser be instructed to furnish us with that information I do not know whether you wish me to put this in the form of a resolution, but I shall be very pleased to propose a resolution asking that all the Governments represented at this Congress furnish the Organiser with a short and concise statement of how their finances are conducted in relation to the cost of roads and not the least important problem is the question of the main traffic roads, some of which will be of an international character which will have to be built or re constructed

Turning to the problem of co operation between railways and road transport, I must say that our proceedings have been somewhat rather disappointing We have had passed to day a resolution which has merely stated that co operation is desirable and there we have stopped I had hoped that in this vast and important assembly some practical suggestions would have been made as to how co operation is to be effected Only one delegate has had the courage of his convictions and that was the gentleman from South Africa who suggested that the Government should take over all forms of transportation I am sure that that suggestion can only come from a country where the Government owned the railways and were anxious for the future of the railways In Great Britain and Ireland, however, and also in other countries the railways are not State undertakings and the Governments would not be well advised to interfere in the relationships which exist if any do exist between the railways and the motor transport organisations which have started up in recent years I feel sure however that the Governments of the
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is the last thing that should be done

I was hoping that Mr Shrapnell Smith with his vast experience would have made some definite suggestion but I observe he was very careful to confine himself to platitudes I do hope that between this and the next Congress we shall all be able to prepare ourselves with some practical solution of the difficulty which is growing in every country, namely, the diminishing railway receipts and the growing road transportation receipts In Northern Ireland the roads are carrying as much traffic as they can bear, whilst the railways are only carrying a 1/100th part of what they can carry I do not want to throw all the traffic back on to the railways, but the railways must get back some of the traffic because the roads cannot stand it, unless the various countries are prepared to spend thousands and thousands upon re-

construction and widening of roads In the end I imagine it will have to be resolved on a financial basis The railways have complained to us, as they have complained in every other country that they have to maintain their permanent way and provide signalling systems whilst on the other hand they complain that the road authorities of the various countries are providing magnificent roads for the motor bus and motor truck to travel on and are also providing police to act as signalmen at the cost of the ratepayers Therefore I think that eventually the problem will have to be considered in this country as in other countries from the point of view of whether the motor users are bearing their fair share of the expense I see Mr Shrapnell Smith is looking at me with horror—(laughter)—but it is a question that cannot be dealt with academically It must be dealt with on fundamental facts and statistics and it is for that reason that I ask that some steps should be taken to obtain from the various countries in the world full statistics of the position in regard to the share borne by motor traffic in relation to the cost of road construction and maintenance

The CHAIRMAN I am sure we all appreciate very much the remarks made by Major Harris but I venture to put in a plea to the remaining speakers that we should avoid going back to previous papers otherwise this Congress will never draw to a close As regards the collection of statistics concerning road maintenance costs the Bureau Permanent has quite sufficient powers and I am sure will bear in mind the suggestion made by Major Harris A very good start has been made in this country There has been a joint committee of the Society of Motor Manufacturers and Traders and the railway companies and if the document is not exactly signed you may take it that figures concerning road maintenance and construction over a long period of years have been agreed and there can be no further argument as to who has paid what and which

Mr SHIGERU KOMATSU (Japanese Department of Communications) In Japan the motor transport traffic system is still in

less activity in this direction than in other countries

Practically all the railways in Japan are State enterprises and, comparatively speaking a very efficient service is maintained both as regards passenger and goods traffic These conditions do not however offer any handicap or disadvantage to the development of motor traffic to which undertaking the State is quite prepared to give full support with a view to promoting the general welfare of the country

In my approximate estimate the entire length of roads in Japan comprises over 775 000 miles, of which 100 000 miles are

said to be suitable for motor traffic Control of the road system is divided as follows —

(a) By the State Main thoroughfares connecting the Capital with all the principal cities in the country

(b) By local administration By roads connecting with the main thoroughfares This includes city town and village roads

During recent years the increase in motor traffic in Japan has been tremendous In view of such increase it has been found necessary to construct modern speedways more or less on the same lines as the latest American roads which are being made approximately 48 metres (about 157 ft) wide Two stretches of such highway of over twenty miles between Tokyo and Yokohama and between Osaka and Kobe have in fact already been completed and opened to traffic and the question of linking other large cities and towns with similar roads is now receiving serious consideration

Whilst the advantages of such roads from a national defence point of view are appreciated it is also realised that if an efficient road transport service working in conjunction with the railways —which is so essential to the well being of the present day commercial system—is desired then the need for such development is vital For this reason every decision which is arrived at in this connection is of the greatest interest

In the short time available our delegates have on this occasion been unable to compile a really comprehensive statistical report on the actual conditions existing in Japan in regard to the motor traffic question We sincerely hope however that at the next opportunity we may have the pleasure of submitting a report of a more substantial nature

May I also take this opportunity of expressing my earnest hope that this Congress be held each year at a different place and also that an International Automobile Association be established through which various important problems of motor transport can be investigated and reports made thereon presented to the next Congress

There is a plan well in progress in our country to establish an Automobile Association on a national basis extending its branches throughout the country When this is well established we have no doubt that many motorists including overseas visitors will enjoy the services and facilities offered by it

In conclusion may I add a few words to express my thanks on behalf of the Government of the country which I have the honour to represent for the opportunity afforded us of participating in the present assembly

Mr KAZIMIERZ TYSZKA (Former Minister of Communications of Poland representing Municipality of Warsaw) The time of our collaboration in this Congress was very short but still it has been very full of most important suggestions concerning the development efficiency and economy of modern motor transport and especially of using it as a necessary extension of the railways in

the country and tramways in the towns These questions are now in my country also becoming acute and knowing them well as a member of the City Council of Warsaw and a former Minister of Transport in Poland I can say that many of them will find a solution on the lines which have been pointed out at this Congress I expect that at one of the next Congresses which I hope will be in Warsaw you will find corroboration of this

Mr ANTONI DABROWSKI (Municipality of Warsaw) I am happy that it has fallen to me to express in the name of the Automobile Club of Poland the greatest sympathy which animates the entire Polish nation in regard to this Congress and to be able to collaborate with all the other nations of the world From the time when it became possible for my country to collaborate with other nations much has been accomplished but still much more work must be done concerning the matters discussed at the Congress One of our greatest problems is the development of motor transport which undoubtedly has a great future in Poland We are convinced that the work of the Congress will show splendid results and the Polish delegates desire to express their greatest pleasure and thanks for the hospitality shown to them in England

Mr G F BAUER (Manager of Foreign Trade Department National Automobile Chamber of Commerce New York) Before

touch upon something
ted I wish to express
delegates here for the
I know that is the feel

ing of everyone of the delegates and I want to assure the Organising Committee of the pleasure it has given us from America to come over to England and renew acquaintances which we have formed at previous Congresses and that we shall go back knowing in our hearts and minds the reality of the words Welcome and Cheerio

Mr H K CARRUTHERS (Secretary of the Automobile Club of Ottawa and the Ottawa Board of Trade) I would like to add a

sure if we have the pleasure of meeting in Rome next year Canada will be adequately represented I can only add that this has been my first trip to the old country and I have enjoyed the last two weeks immensely Unfortunately I had to be absent yesterday owing to an engagement made some few weeks ago but I have enjoyed my attendances at the Congress and I shall go home full of enthusiasm regarding road problems and satisfaction at the acquaintances which I have made among the representatives of the various countries attending the Congress

Mr I M SUMMERFIELD (Society of Irish Motor Traders) We have had an unique experience in the Irish Free State in road building in the last few years I will not attribute that to any

definite cause, although you can probably suggest a few reasons yourselves (Laughter) We have however done wonders with our roads in the Irish Free State in the last few years We have extended them to the full width permitted by the hedges and have done everything we can to improve their condition Undoubtedly, we have got to have the roads whoever pays for them, and it is ultimately the ratepayer Nevertheless the suggestion made by Major Harris as to collecting information concerning the position as regards payment for the roads in the various countries of the world is a very useful one and if it can be got together in a readily accessible form it would be extremely useful In our small way in the Irish Free State we may be able to contribute to the pool of general knowledge because we have some special problems of our own Across the whole of Ireland there are bog lands and the construction of roads on these is a very different proposition from the problems of constructing roads from London to Birmingham for instance Our engineers have had to surmount these difficulties and their experience would no doubt be useful to others I suggest seriously that the question of analysing the cost of roads and maintenance is a matter which should come within the purview of the Congress and I make that suggestion for your approval What I have in mind is that the Congress should set up a special road construction information bureau to collect information from all over the world about the materials used in the making of roads their relative costs depth of foundations surfacing angle of corners, the advisability of some banking at corners camber and non skidding surfaces In this way the experience and information possessed by the wealthier nations could be placed at the disposal of the smaller nations where experimental work obviously, is not possible because of its cost

Mr T W LOUGHBOROUGH (Secretary Auto Cycle Union, and Secretary General of the Federation Internationale des Clubs Motocyclistes) Arising out of Mr Stenson Cook's resolution passed yesterday I have a suggestion to make which may possibly shorten to a small extent the period that generally elapses between a pious resolution and practical politics In his opening remarks yesterday Lord Birkenhead told us that when he toured

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escape The suggestion I have to make is that all the Government representatives whom we are so pleased to have with us should take some steps to educate and train their minor customs officers to adopt a different attitude towards the public These officers always seem to me to be inordinately impressed with an enormous idea of their own importance and regard the unfortunate motorist as a potential criminal who is guilty until

he proves himself innocent I do not suggest that the senior officers adopt this attitude but I do suggest that if the junior officials could be instructed to be a little more human take on a little of the kindliness of the London policeman the courtesy would not be abused and one of the greatest handicaps to foreign touring would be eliminated

The CHAIRMAN I have had a communication from Mr Rajam of Calcutta asking that it should be made clear motor distributors and motor transport companies are included in this Congress With that I am sure we have every sympathy and as a matter of fact all organisations who are at all concerned with motor distribution or transport companies have been and will be invited to send delegates to this Congress

M L BACQUEYRISSE The Union des Voies Ferrées et des Transports Automobiles de France did me the honour of inviting me to represent them at this Congress It is therefore in the name of that body that I offer greetings to the delegates who have taken part in the work of the Congress which has proved so successful In view of the fact that the Congress has been held in this beautiful metropolis of London the generally accepted model of public transport development and in particular of public motor transport success was indeed only to be expected

Speaking personally as the General Director of Exploitation and Technical Services of the Société des Transports en Commun de la Region Parisienne I have pleasure in remembering that before completing the plans for the modernisation of the tram ways and omnibuses in Paris it was from London especially that I gathered much useful and interesting information

During the different sessions of the Congress special speakers have drawn attention to the ever increasing relationship between the railway and the motor vehicle The Union des Voies Ferrees et des Transports Automobiles de France as its name indicates has been for a long time convinced of the necessity for co operation inasmuch as it represents a grouping of the various systems of transport

Such meetings as we have had this week are regarded by the Union as extremely valuable and useful The Union is itself a member of the Union Internationale des Tramways des Chemins de Fer d Intérêt Local et Transports Publiques Auto mobiles the headquarters of which are in Brussels

This international union has been recently reorganised on a proper basis as a result of which its membership has been increased by over two hundred constructional and exploiting con cerns It organises a congress every two years The last inter national congress held in Barcelona was a brilliant success The next Congress is to be held in May 1928 in Rome—in the beautiful country of Italy which Senatore Crespi has just asked us all to visit

I cannot too strongly urge those delegates present who are interested in the running of road transport services and motor

vehicle builders who are also admitted to the Congresses of the Union Internationale to join hands with us in order further to increase its importance and to derive benefit from the results of the enquiries as to the working of services as given in the various papers that are presented

It is by international co operation that continuous progress is made in the branch of industry in which we are all interested striking evidence of this being afforded by the work of the World Motor Transport Congress I have already alluded to the valuable results of my visits to the public transport services in London I may also add that the Société des Transports en Commun de la Region Parisienne is in close and friendly relations with several large English public service undertakings and in particular with the London General Omnibus Co with which we frequently exchange technical information through the medium

to the other It is in the wider
all forms of transport afforded by
I invite the delegates to take part

coupling with this the hope that the World Motor Transport Congress will continue to go forward in its career of success

M JOSEPH DE WALQUE (Delegate of the Belgian Government *After such interesting discussions it is a pleasure for me to rise*
and thank ndness in
inviting th at this
assembly have been
able to gath pass on to
my colleagues upon my return

I should like you to know that I am particularly conscious of the kindness and courtesy which the Organising Committee have extended to me I shall always remember the kind reception accorded to me and for which I tender my sincere thanks

Mr F J McDOUGALL (Australia) I have one suggestion to make though not in the form of a resolution but before doing so I should like to congratulate the S M M T on the great success of the first Congress held in this country It is not necessary to say anything about that success because other speakers have already emphasised that sufficiently The suggestion I want to put forward particularly to the Society of Motor Manufacturers and Trade is that at these various World Motor Transport Congresses it might be very desirable if arrangements could be made whereby the British Empire delegates could meet together separately at some time during the Congress as a British delegation to discuss questions that are of Imperial rather than world interest I should like to go one step further perhaps There will be years when there will be no World Motor Transport Congress but each year there are Motor Exhibitions in London both for private cars and commercial vehicles and perhaps in the years when there is no World Motor Transport Congress some special meeting could be arranged for delegates from various parts

of the British Empire to discuss matters of Imper al interest

The CHAIRMAN I can assure Mr McD u ll hat his sugg tion will be very carefully considered by the S M M T

It is now my privilege to bring this very interesting and I hope very successful Congress to a close but I hould be lacking in my duty and also omitting to express what I feel if I do not say how indebted I am as Chairman of the Comm ttee to you all for attending the Congress for the very cor lial way in which the papers have been followed and for what I thinl is the remarl able level of attendance which has been ma ntained throughout the whole Congress To me personally t is most gratifying but without assistance th s Congress would have been simply a fiasco In fact during the sessions of the Congress you will have noticed how ably I have been assiste l I have been relieved from my duties in the Ch ur on several occasions but everything else is small compared with the efforts which have been made by Mr Wyatt and h s staff I do not l now what you feel about it but I think the staff worl in connection with the Congress has been remarkable in view of the difficulties These difficulties have been very real and when you realise that on Friday morning last there were no fewer than thirty substituted names and twenty additional names added to the Congress you will at once appre ciate the manner in which Mr Wyatt and his small staff has carried out the work of organisation It is that organisation which has enabled the Congress to work so smoothly (Applause)

Mr HORACE WYATT I am very grateful indeed to the Chairman and to you all generally for the reception that you have given to the words that have just been spoken about myself and my staff There is only one remark I would like to make—that at this Congress we have been discussing essentially means of com munication I have been surprised myself as well as pleased at the knowledge of the delegates from foreign countries of the English language When one travels on foreign railways one picks up a certain number of useful phrases I think I can say It is forbidden to smol e in eight languages and Do not spit in about eleven but one does not become conversant with

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speeches by foreign delegates in el that Congresses of this nature improve the means of communi but also by word of mouth and lerating the pr gress of the worl l

The Congress then close l

SECTION II.

COMMUNICATIONS

(in extenso)

PRESENTED TO THE CONGRESS.

For list of Communications, see next page.

WORLD MOTOR TRANSPORT CONGRESS,

LONDON, 1927

Complete List of Papers Submitted.

TRANSPORT IN AUSTRALIA WITH SPECIAL REFERENCE TO ITS PROBLEMS AND REQUIREMENTS AND TO POSSIBLE FUTURE DEVELOPMENTS

Prepared by The Development and Migration Commission Australia

THE ORGANISATION OF GOODS AND PASSENGER CARRYING ROAD SERVICES IN CONNECTION WITH HUNGARIAN RAILWAYS

Prepared by T S Haltenberger Engineer of the Motor Transport Company of the Hungarian Railways

MOTOR TRANSPORTATION IN FRENCH NORTHERN AFRICA

Prepared by M Regnault Director and General Secretary of the Societé des Voyages et Hotels Nord Africains

ROAD TRANSPORT CONDITIONS IN PALESTINE

Memorandum prepared by the High Commissioner for Palestine

SOME NOTES ON THE PART PLAYED BY THE MOTOR VEHICLE IN THE DEVELOPMENT OF TRANSPORT IN IRAQ

Prepared by Muzahim Bey al Pachachi Iraq Diplomatic Agent

ROAD CONSTRUCTION AND IMPROVEMENT IN RELATION TO THE DEVELOPMENT EFFICIENCY AND ECONOMY OF ROAD TRANSPORT

Prepared by Major R A B Smith A C G I and submitted on behalf of The Commercial Motor Users Association

THE NATIONAL GOOD ROADS MOVEMENT AND THE DEVELOPMENT OF MOTOR BUS SERVICES IN CHINA

Prepared by Mr Tsooming Chiu submitted on behalf of the Chinese Ministry of Communications

CONSTRUCTION AND IMPROVEMENT OF ROADS IN GERMANY

Submitted by the Delegate of the German Motor Road Construction Research Association

THE HIGHWAY SITUATION IN THE UNION OF SOUTH AFRICA

Prepared by J W Walshaw Joint Hon Secretary South African Good Roads League

THE DEVELOPMENT OF MOTOR VEHICLES SUITABLE FOR SERVICE ON BAD ROADS AND ACROSS COUNTRY

Submitted by the British War Office

THE DEVELOPMENT OF MOTOR VEHICLES SUITABLE FOR SERVICE ON BAD ROADS AND FOR CROSS COUNTRY USE

Prepared by Sir John E Thornycroft K B E M Inst C E one of the Delegates of the Institution of Automobile Engineers

ROAD CONSTRUCTION AND IMPROVEMENT IN RELATION TO THE DEVELOPMENT EFFICIENCY AND ECONOMY OF ROAD TRANSPORT IN INDIA

Prepared by The General Staff Branch of the Army Department Government of India

THE SIX WHEEL MOTOR BUS AND ITS ADVANTAGES FROM THE POINT OF VIEW OF SUSPENSION

Also

MODERN PROCESSES FOR UTILISING GASES IN ENGINES COAL GAS AS AN ALTERNATIVE TO MOTOR SPIRIT

Prepared by M L Bacqueyrisse Directeur Général de l Exploitation et des Services Techniques de la Société des Transports en Commun de la Region Parisienne

THE IMPROVEMENT OF FACILITIES FOR INTERNATIONAL TRAVEL BY ROAD

Prepared by Stenson Cooke Member of the Executive of the Alliance Internationale de Tourisme and Secretary of the Automobile Association of Great Britain

ROAD TRAFFIC CONGESTION AND OTHER PROBLEMS

Prepared by Mervyn O Gorman C B D S O M I C E and submitted on behalf of the Royal Automobile Club

THE IMPROVEMENT OF FACILITIES FOR INTERNATIONAL TRAVEL

Presented by Dipl Ing R Filser and submitted on behalf of the Allgemeine Deutsche Automobile Club

THE NECESSITY FOR CO ORDINATION OF RAIL AND ROAD TRANSPORT

Prepared by N D Ballantine Consulting Engineer on Railway and Transport Matters and submitted on behalf of the Society of Automotive Engineers

BENEFITS OF A CO ORDINATED RAIL AND HIGHWAY SYSTEM IN NEW ENGLAND

Prepared by David L Bacon Supervisor of Automotive Equipment New York New Haven and Hartford Railroad

THE NECESSITY FOR CO OPERATION BETWEEN ROAD AND RAIL TRANSPORT THE POSITION IN GERMANY

Submitted by the Delegates of the German State Railway Company and of the Office for German Railway Motor Traffic

THE MOTOR VEHICLE AS AN EXTENSION OF THE RAILWAY

Prepared by M Pourcel Chief Engineer of the Paris Lyons and Mediterranean Railway

THE DEVELOPMENT OF GOVERNMENT OWNED MOTOR TRANSPORT SERVICES IN SOUTH AFRICA

Prepared by Sir William Hoy, General Manager of the South African Government Railways and Harbours

THE NECESSITY FOR CO OPERATION BETWEEN ROAD AND RAIL TRANSPORT.

Prepared by Major James Paterson M C, and J B Osler, O B E, M I A E, on behalf of the Commercial Motor Users' Association

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Transport in Australia; with Special Reference to its Problems and Requirements; and to Possible Future Developments.

Prepared by the Development and Migration Commission in Australia

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The Continent of Australia covers an area of nearly 3,000,000 square miles more than 25 times that of Great Britain and Ireland combined It measures 2 000 miles from North to South and 2,400 miles from East to West In this great area there are at present only 6 000 000 people or 2 per square mile

The population however is far from evenly distributed, 46 per cent live in the six capital cities, 16 per cent in the smaller towns and 38 per cent in the country The density of population is greatest in the farming country along the East and South east coast and in the south west of Western Australia diminishing inland from this belt through the agricultural country—where it ranges from one to a square mile to one to four square miles—to one in four square miles to one in sixteen square miles in the dryer pastoral areas Great tracts in the centre, North and North west are barely populated at all

For comparison it may be mentioned that the density of population in Great Britain is 393 in France 184, and the United States 37 per square mile

The centres of industry and manufacturing are for the most part in the vicinity of the main ports at the capital cities of the six States or elsewhere along the coast, except for a few mining centres inland

The country produces annually some 30 000,000 tons of primary produce, while the imports of goods from overseas amount to 4,500,000 tons

With conditions such as these it is evident that the question of producing adequate cheap and efficient transport facilities for the movement of goods and passengers is one of some magnitude and, moreover, one of vital importance to the success of commerce and industry and to the prosperity of the country as a whole

To meet these requirements much has already been done, but the demand for more and better transport is constant, and if the

development of the country is to proceed unchecked, it is imperative that adequate transport facilities should be maintained

Railways

In the eastern, south eastern and southern parts of Australia a network of railways has been established converging from the various pastoral, mining and agricultural districts towards the principal ports which are themselves connected by lines running approximately parallel to the coast In the south west of Western Australia there is another connected system of lines between the ports of that State and the settled country districts The trans Australian railway connects the eastern and western systems

The railways are owned and operated by the State Governments excepting the trans Australian and two other lines in Central and Northern Australia which have been constructed or taken over by the Commonwealth Government

The great disability of the Australian railways system as a whole is the difference of gauge between the various State systems, necessitating not only the reloading of freight at border stations but also in some cases entailing the transport of goods long distances to one port when they might more economically have been sent to another

However after considerable deliberation, a start has been made towards ultimate unification Proposals have been agreed upon by the several States concerned for establishing a standard gauge main line of approximately 3 500 miles in length between the capital cities from Brisbane to Perth The line which will connect Brisbane to Sydney without a break is now under construction It will naturally be many years before the scheme is completed as it will ultimately entail the conversion of all the broad gauge lines of Victoria and South Australia, The cost is estimated at £21 600,000

The State systems are in general laid out on a plan which, so far as present development has gone, very reasonably covers the areas they serve As regards inter state lines and lines serving the border areas of States, in some cases these have in the past been located rather with a view to furthering the interests of one particular area and not with a view to attaining the greatest efficiency for the benefit of the country as a whole However, such matters are now looked at from a broader view point, and it is realised that a liberal long sighted policy is eventually to the benefit of all As an instance of this the State of Victoria is now actually constructing two lines of Victorian gauge within New South Wales territory

It is sometimes maintained that such a system of lines based as it is on the capital cities of each State, leads to an undue amount of centralisation at these cities, at the expense of the smaller ports along the coast With regard to coastal shipping this may be so to a certain extent and it will undoubtedly

desirable to further develop some of these smaller ports in the future, and to ensure that they link up on a reasonable plan with the railway system With regard to overseas shipping, however, the establishment of more ports of call is as yet hardly justified, the well equipped main ports can easily and economically handle the present volume of freight

The railways in all States are being steadily extended as the demand for transport increases or as the need for opening up new areas arises In most cases these new lines are laid to carry light loads only and are strengthened and improved as the traffic increases

The extent of the effort that has been made in the past to provide adequate railways is evident from the fact that Australia has—with the exception of Canada—a greater length of line per head of population than any other country Australia and Canada both have nearly 5 miles of track per 1 000 of population no other country has more than 2½ miles, while most of the European countries have only half a mile However, the scope for extension in the future is also indicated from the fact that Australia has only 9 miles of track per 1 000 square miles of area which is lower than any other civilised country Great Britain has 223 miles per 1 000 square miles and the United States of America 86

The railways being State owned the freight and passenger charges are in general regulated on the principle that they shall be at cost In certain cases where it is deemed advisable to assist some particular district or industry, the rates are lowered

The average rail charges for the various State systems as a whole may be of interest For the cheapest class of freight which covers in general such goods as agricultural and mining produce building materials etc the rate ranges from just over one penny per ton mile for hauls up to 50 miles to just over one third of a penny for hauls up to 500 miles

First class passenger rates range from 2 1/5d per passenger mile up to 50 miles to just over 2d for 500 miles second class 1½d up to 50 miles and 1 1/3d for 500 miles

Roads

In the same way as the railways, an extensive system of roads covers the populated areas the construction and maintenance of which are in general part of the functions of local authorities but in some States this is undertaken directly by the States Governments In others a certain proportion of the roads is constructed and maintained by the Government which in addition, advances money to municipalities to be expended on main roads under the supervision of special Boards

Detailed figures are not available as to the actual number and length of roads, but certainly not more than one fifth are metalled and suitable for heavy motor traffic The unmetalled roads of the back country are fairly adequate for light motor or horse

traffic in the dry weather In fact under such conditions and where the country is not hilly they prove excellent for cars However, after rain, especially on the black soil plains they may become almost impassable As to the made roads the actual lengths of roads necessary is so great in proportion to the population that it is not practicable to maintain them in as good condition as might be desired They cannot for instance be compared with roads in such a thickly populated country as England It would be necessary to reduce the population of Great Britain and Ireland to 240 000 people before a comparison could be made

With the increased use of motor vehicles the question of providing better roads is becoming more and more important The Federal Government fully realises this necessity and recently it has made a special grant of £20 000 000 towards the construction and maintenance of roads by the States during the next ten years *This is of course in addition to the sums at* present spent on roads in each State as normally it is a State matter and not a function of the Federal Government The expenditure of this money will be supervised by the Federal Government to ensure that it will be used towards providing a well co ordinated system of national roads and not only for the benefit of particular districts or areas

Motor Transport

The following table sets out the numbers of motor vehicles (cars motor cycles and commercial vehicles) registered in Australia during the last six years together with the population figures and the resultant number of persons per vehicle

Year	Number of Cars Motor Cycles and Commercial Vehicles	Population	Persons per Vehicle
1921–22	139 000	5 503 000	39
1922 23	175 000	5 633 000	32
1923–24	241 000	5 749 000	23
1924–25	305 000	5 873 000	19
1925 26	390 000	5 992 000	15
1926–27*	482 000	6 110 000	13

* Preliminary figures

The reduction in the price of cars during recent years, the extended adoption eneral prosperity of the this remarkable increase The main explanation must lie in a growing realisation of the value and advantages of motor transport, and above all a realisation of the fact that it is an economical and paying proposition T the country the car has become a necessity to the man on

land and together with the telephone has very materially altered the conditions of life out back From almost every town on the railway there are now car services radiating out into the country carrying mails passengers and parcels

The lorry and the passenger bus are being used more and more for much the same purposes for which they are employed in other countries as feeders to the railways in the country and for the carrying of goods and passengers in and around the cities

The lorry has not yet taken the place of the horse or bullock team for hauling heavy loads of wool or other primary produce to the railways in the country districts or of stores and supplies from the railways out into the country The cost of such trans port by horse team in the back country ranges from 10d to 1s 6d according to the road condition

The cost of petrol in Australia is at present about 2s per gallon at the ports Throughout the farming districts say within a distance of 200 miles from the coast it costs up to 2s 6d In the main pastoral areas 200 to 400 miles from the coast it ranges from 2s 6d to 3s 6d according to the distance it has to be carried by rail and road Further inland the cost may reach 5s per gallon or more These prices combined with the lack of adequate roads are the main reasons why the motor lorry cannot yet compete with the horse team for transporting heavy loads in the country

The motor traffic in the cities has grown to such an extent that congestion is beginning to be felt in the central areas It is to be noted however that the very nature of the cities them selves laid out on a generous plan and covering a much greater space than cities of equal population in older countries has only been made possible by the aid of modern transport facilities in which the car and the bus take no small part

Co ordination of Rail and Road Services

The very considerable recent increase in the use of motor transport has naturally given rise to the question of the proper co ordination of road and rail The competition of the car and the bus as passenger carriers is being felt by the railways and tramways more especially in New South Wales and Victoria where the passenger traffic on the metropolitan railways is com paratively greater than that of the other States It is also felt in the country on bran
involved The situation
become necessary actually
on some lines

The amount of goods freight carried by road in direct competi tion with the railways is as yet small and not great enough to have very much effect however the freight thus carried mostly consists of commodities for which high rates are chargeable on the railways and moreover the amount is growing

This is a problem which is not confined to Australia It is being felt wherever motor and rail transport are operating on a large scale, but in Australia it assumes a more definite form as the railways as well as the roads are owned by the States, and any loss of railway revenue as well as any increase in the maintenance costs of the roads has eventually to be met by the same taxpayer This being so, it may be that Australia is in a better position to arrive at a reasonable solution than other countries The Prime Minister, speaking at a Transport Conference in Melbourne in 1926 referred to this important question as follows —

" I see no reason for a clash between the genuine national functions of these two great branches of the transport industry

If it comes, it is because particular interests or authorities are seeking to set themselves before the general welfare

In many instances, railways and main roads run parallel so that there is—if we look at the matter from a narrow point of view—considerable temptation to interfere with the natural development of transport so as to guard vested interests I fully recognise the force of the temptation, but I am equally clear in the opinion that it must be resisted In the long run, the most efficient transport—whatever form it takes—means the most efficient industry and the wealthiest and most prosperous people "

Thus the importance of the problem is fully realised, although no definite policy has yet been arrived at However, it is becoming clearly evident that if the transport system as a whole is to operate at its highest efficiency, and if the public are to derive the greatest possible measure of service from it on a sound economical basis, some definite policy as to co ordination is called for, not only in order to minimise wasteful duplication of services and consequent economic loss to the community, but also to ensure that the cost of road maintenance is kept within reasonable limits, and that the capital expenditure of public money on established railways and tramways is in some measure safeguarded The problem clearly is, to secure the greatest amount of service from both road and rail with the least possible restriction and interference to either It is a question which must be approached in the spirit of the Prime Minister's remarks just quoted

New Types of Vehicles

The advent of the six-wheeler is being watched with considerable interest These vehicles appear to be admirably suited to Australian conditions In
use on inferior roads, it is felt
for extending transport facil

A limited number are already in service, owned by the oil companies and used as tank lorries for the distribution of petrol It is interesting to note that on of these companies is using the

on the good roads in and around the cities while another is putting them into operation in the country where the road conditions are severe In both cases they are already clearly demonstrating their advantages over four wheelers both in efficiency and economy However the development of the six wheeler has been so rapid that its capabilities are not yet widely realised in Australia

The progress of the development of the tracked vehicle is also being closely followed It is considered that these vehicles may perhaps have application for the transport of heavy loads on the unmetalled roads of the interior at present undertaken by horse drawn wagons The possibility of utilising tracked vehicles to establish transport services over definite routes either instead of constructing a permanent railway or as connecting or feeder lines to present railways is also being seriously considered If this should prove a practical proposition it will of course be of great benefit in opening up new areas for settlement where a permanent railway would not at present be justified

The great potential advantage which the tracked vehicle seems to possess is its ability to carry or haul heavier loads thereby reducing the cost per ton mile over roads where wheeled vehicles cannot economically operate Moreover the flexible tracks now being developed promise to allow this to be done without undue damage to the roads

The possibilities and limitations of these new vehicles have not yet been tried out or demonstrated on any large scale in Australia However the six wheeler at least and possibly the tracked machine certainly seem to offer an improved performance compared with the four wheelers now in use and consequently they will have a greater economic radius of action Just what this increased radius will prove to be particularly when the vehicles are used as feeders to the railways remains to be found out Its determination is of some importance and urgency as not only will it permit cultivation to be carried on economically at greater distances from the railways but also it will affect the location of new lines now under consideration perhaps making it possible to space parallel lines further apart and obviate the necessity for constructing certain spur lines

Transport of Sheep

There is one particular problem which motor transport may quite possibly solve in the near future From time to time various pastoral districts of Australia are stricken by drought and on these occasions it is very often the case that great numbers of sheep are lost because of the impossibility of moving them to areas where the grass is plentiful either through lack of railways or because there is no grass on the road to railing points Several attempts have been made to move sheep by lorry but until recently it has not proved a practical proposition

Lately however it has been carried out successfully in Queensland and on one occasion 7 000 sheep were moved a distance of 220 miles without undue loss or damage to the sheep and at a comparatively reasonable cost

In this case after several experiments with different types of bodies and trailers a simple three deck body was evolved mounted on the lorry itself no trailer being used This vehicle carried 215 sheep equal to a load of about five tons The top two floors were detachable so that the lower compartments could be loaded first the essential features being that the sheep were packed in a lying down position and when the top floors were in place they had not room to stand the floors being 16 ins apart In this way the sheep cannot get injured by the movement of the lorry on a rough road

Contractors will now undertake this work on a basis of 2s 2d per sheep per 100 miles which includes returning empty The significance of this development will be realised from the magnitude of the wool industry and its importance to Australia There are some 100 million sheep in the Commonwealth and last year —1926 27—when the total value of exports was £144 000 000 the export of wool amounted to £60 000 000

Motor Fuel

Practically the whole of Australia s requirements for motor fuel are imported from overseas For the 482 000 vehicles in use last year 145 700 000 gallons of refined spirit were imported, which does not include spirit refined in Australia from imported crude oil As opposed to this 1 250 000 gallons of benzol and a negligible quantity of alcohol motor spirit were produced within Australia

The value of the imported spirit amounted to £6 600 000 a sum which has rapidly grown with the increase in the number of vehicles from £3 000 000 in 1921 22 This large and growing annual expenditure is becoming a considerable economic strain, and is tending to have an adverse effect on the balance of trade Moreover Australia s dependence on external sources of supply for such an essential commodity and the possibility of an interruption of the supply in case of war constitutes a grave danger Thus the question of producing an adequate quantity of motor fuel within the Commonwealth is of the greatest importance to Australia and one of the major problems with which the country is faced It may be of interest to note that the Council for Scientific and Industrial Research consider that liquid fuel supply is one of the five most important and urgent subjects upon which it should concentrate its research activities

The establishment of the Commonwealth Oil Refinery for the treatment of imported crude oil is a first step towards reducing the expenditure on imported fuel However this does not reduce the dependence on other countries for supplies There are indications that petroleum deposits exist at various localities in

Queensland and Western Australia and also in Papua, but despite the encouragement of a considerable reward offered by the Government for its discovery, oil has not yet been struck in commercial quantities

Apart from the discovery of oil in the future, the various sources which may be considered as offering possibilities of a local supply of fuel sufficient to alleviate the situation to any extent include—benzol, alcohol, oil, shale oil from coal, and producer gas

Benzol —The production of Benzol depends largely on the practice of high temperature carbonisation of coal, the benzol being extracted as a by product At present, about 1 300 000 tons of coal are carbonised in Australia yearly, at gas works, in coke ovens, at steel works &c If the whole of this was treated for benzol it could only produce some 3 000 000 gallons not a fiftieth of the amount required

The amount of coal carbonised is not likely to be greatly increased in the near future Moreover, the only coke plant of any size at present equipped for by product recovery is that of the Broken Hill Proprietary Steel Works at Newcastle N S W Thus, while the production of benzol might well be increased, it cannot greatly affect the main problem

Alcohol —Australian climatic conditions are well suited for the growth of plants containing sugar and starch from which alcohol may be made *In recent years the Colonial Sugar Refining* Company have been making a limited quantity of alcohol motor spirit from molasses a waste by product of their sugar mills and a most suitable material for the production of alcohol But in this case also the total amount possible from all available molasses would not be more than 6 000 000 gallons Apart from molasses, many of the next most suitable materials for the manufacture of alcohol are too valuable as foods or fodders to be used for this purpose However it is considered that ' cassava " and arrow root at least may be cultivated in Queensland cheaply enough The experiment is being encouraged by the Government by means of a bounty on alcohol produced from these plants, part of the bounty going to the growers

Recently a distillery has been erected with a capacity of 1 000 000 gallons It is at present operating on molasses but it is intended to treat these cultivated crops as they become available The prospects of a considerable supply of fuel from this source are promising but the development will probably be slow It is likely that the alcohol will be mixed with other fuels to make a composite spirit, and at first marketed in and around the area in which it is produced

There is no lack in Australia of materials from which alcohol theoretically, may be made, and it is always possible that a process may be discovered by which wood straw and other *cellu lose* materials can be economically turned into fermentable sugars for distillation into alcohol Should such a process be evolved,

long way towards
hat of the world
New South Wales
and Tasmania estimated at 40 000 000 and 12 000 000 tons respectively These have both been worked but the production is at present small Profitable exploitation of these resources would seem to depend on the discovery of more economical methods of mining and retorting moreover the total amount of fuel that could be supplied from this source is limited

Oil from Coal —There is undoubtedly scope for the extraction of oil from Australian coals both from black coal and from the extensive deposits of brown coal in Victoria when the details of a process adapted to Australian conditions are arrived at The economics of the question however have not yet been clearly demonstrated The disposal of the by products would be a difficulty if the operations were at all on a large scale In this connection it must be remembered there is not the same market in Australia for coke and gas as in England for this reason a process of hydrogenation may prove more suitable than low temperature carbonisation if it should prove practicable to treat Australian coals by this method In connection with these processes it is to be noted that a supply of lubricants would also be produced which is not the case with alcohol

Producer Gas —The development of gas producers for use on motor vehicles is being followed with great interest If they prove reliable and do not require an excessive amount of attention there is ... more especiall ... ol is high Woo ... y where However *the cheapest simplest and most practicable* method of producing the charcoal has not yet been determined

Future Development

The population of Australia is growing at the rate of 2 per cent per year Compared to that of other countries this is rapid the rate in England being 0 4 per cent in the United States 1 4 per cent and in Canada 1 8 per cent If this rate is maintained the population of Australia will reach 7 000 000 in 1933 and 10 000 000 in 1951 There seems no reason why this increase should not take place According to the most reliable estimate there is room for 60 000 000 people in the fertile temperate regions of the east south and south west alone—omitting the perhaps less hospitable tropical areas of the north—before the density of population reaches that of Europe to day This 60 000 000 would include of course a large industrial population centred on the coalfields near the coast It is doubtful if there is any other country in the world with such a prospect of development and expansion before it

Transport facilities will naturally grow with the increase of population but the important point is that they are one of the

essential facts in developing the country to day and preparing it to receive this future population In many districts adequate transport is the first and the most important factor This is fully realised by the Government in its endeavours to encourage and assist migration Under the Migration Agreement between the British Government, the Commonwealth Government and the State Governments whereby £34,000 000 is being made available at a low interest rate for developmental schemes, considerable expenditure has already been incurred for the construction of roads and railways This money is only available under the con dition that as a direct result of its expenditure the State Govern ments undertake to establish one migrant for every £75 so spent

Problems and Requirements

In any consideration of the problems and difficulties in connec tion with transport which present themselves in Australia that of the fuel supply is by far the most important and of the greatest magnitude It is perhaps of greater relative importance to the Commonwealth than it is to any other country The cost of petrol will always remain comparatively high These conditions are favourable for encouraging the development of alternative fuels, and it may well be that such fuels will first be evolved and find a practical application in Australia

The problem of co ordination of transport facilities in particular with regard to motor transport and railways is a growing one no formula for the equitable solution of which has yet been arrived at

Roads because of the great distances involved and the com paratively small population, are likely to remain for a long time less adequate than might be desired Thus, vehicles more suited to operate under imperfect road conditions are called for The six wheeler seems well on the way to meeting this need

There would also seem to be scope for a vehicle to carry or haul heavy loads over the unmade tracks of the interior, which would be used to provide transport services where at present the construction of a railway is hardly justified Perhaps the solu

Australia, but for the most part it will be seen that Australia s transport problems and requirements differ only in degree from those of many other countries

The Organisation of Goods and Passenger-Carrying Road Services in Connection with Hungarian Railways.

By T S HALTENBERGER,

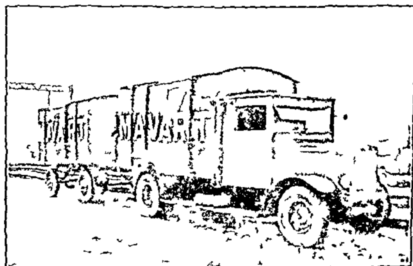
Engineer of the Motor Transport Co of the Hungarian Railways

The Motor Transport Co of the Hungarian Railways, which I represent, is operating inter city 'bus lines and long distance goods transportation services One natural consequence of the development of the automobile movement is that it has in most countries given rise to competition with the railways as regards both passenger and commercial goods transportation In Hungary, mainly an agricultural country, the position is the same *this being clearly shown by the annual returns issued by* the Hungarian Railways The lower fares rendered possible by the relatively small capital required and the comparatively low cost of operation, coupled with the flexibility and speed of motor road vehicles, have in many cases provided the public with a better more comfortable and economical road service than is available by rail Some idea of the effect such motor road vehicles has had on the railways may be gathered from the fact that on the lines having a length of less than 100 kilometres (62½ miles) there has been a falling off in the goods traffic of 20 per cent while in the number of passengers carried particularly between such stations necessitating during the journey a change of trains the decline has been from 50 to 70 per cent

The question therefore arose whether, if these privately organised services can attract so much passenger and goods traffic to the road vehicles the railway authorities should not them selves organise motor road services After careful study of the question, and after much preliminary work, a new organisation known as the Motor Transport Company was brought into being in the course of 1926, and started to run motor vehicles on certain routes In deciding upon the vehicles to be employed, consideration was given to the support of the home industry, the order for the 3 ton truck chassis being consequently placed with the Hungarian State Machine Factory, and that for the bodywork with other home firms *For goods transportation purposes a*

trailer is used in conjunction with each truck as shown in the accompanying illustration both are fitted with covered bodies of the railway wagon type with side doors the load carrying capacity in each case being 3 tons The trucks are equipped with 36 × 8 in straight side balloon pneumatic tyres twins being used at the rear and the trailers with similar tyres of 34 × 7 in size

The system of transportation adopted is based on the practical experience of British and American organisations, with modifications to suit the conditions obtaining in Hungary As a beginning the company established a number of central depots these being located at distances from each other of from 100 to 110 kilometres (62½ to 68¾ miles) In this way it is possible for a vehicle



One of the Motor Trucks and Trailers of the Motor Transport Company of the Hungarian Railways

starting from any one central depot in the morning to return thereto ... provided a garage ... al requirements ... ual general overhaul may be effected At the ends of the lines and even at certain points along the roads traversed provision has been ... mm lat on for one or two vehicles acco ... is al ... of spare parts ... comprises 7 per cent engine parts 7 per cent magneto parts 1 5 per cent carburettor details 7 per cent cooling system parts

5 per cent steering gear parts &c A representative stock of replacement parts is also maintained at the modern central repairing establishment which is equipped to allow the general overhauls to be completed in minimum time

So far the company has established four central depots in connection with 20 routes on which a total of 50 trucks and 70 trailers is running With an aggregate load of 6 tons the vehicles attain a speed of 40 kilometres (25 miles) per hour The programme for 1928 provides for the running of services over from 50 to 60 routes to meet the requirements of which will necessitate an extension of the fleet Although it will take from two to three years to carry through the scheme of providing the whole of the country with goods carrying services of motor vehicles the results so far achieved give grounds for the greatest optimism

The technical part of the transportation work is handed over by the company at every central depot to well known transport firms In the smaller places the local dealers act as the company s agents being allowed a certain percentage per ton for goods collection and delivery In the case of short distances where time wasting delays are unavoidable horse drawn vehicles will be used for goods collection and delivery

At the larger central depots in order to avoid delays owing to the loading operation the bodies of the trucks and trailers will be lifted from the chassis by cranes on to a car which can be run to the loading platform Meanwhile the truck chassis can be used either on another route or run into the garage for a brief inspection

There being a close association between the company and the railways the site of the central depots has been chosen so that goods may be quickly transferred from railway wagons to the motor trucks and vice versa from the trucks to the wagons the latter arriving at one side of the depot and the motor vehicles loaded or unloaded at the other The general idea is that in the case of goods consigned to a destination served from a central depot more than 100 kilometres (62½ miles) from the starting station the goods shall be transported by rail as far as the central depot and thence to the customer s door by motor vehicle

It is unnecessary to accentuate the effect of these innovations on the commercial life of the country In addition to a few statistics I may however draw attention to the fact that in small villages or towns it is no longer necessary for a trader to lock up considerable money in goods since as a result of the company s rapid and cheap system of transportation, he can carry a smaller stock than was formerly necessary From the point of view of national economy also they are of importance For example the bodies of the vehicles can be quickly adapted for the rapid conveyance of perishable fruit from the producers to the consumer as well as for the transport of furniture etc Again the fact that farmers may obtain within twenty four hours

from the time of ordering replacement parts for the repair of broken agricultural machinery is of special importance, especially when the crops have to be gathered in within a very short period of time

The early days of the new road motor goods service have not been without their difficulties Partly owing to the conservatism of the public, and partly to the fact that the services were not generally known, only a very small percentage of the loading capacity of the vehicle was at first utilised Indeed on four routes only a total of 3 700 quintals (about 370 tons) were handled during the first 10,000 kilometres (6 250 miles), this representing only 35 per cent of the load carrying capacity of the trucks and trailers (6 tons) After 20 000 kilometres (12,500 miles) had been completed, 38 per cent of the available capacity was being utilised After 100 000 kilometres (62,500 miles) 53 per cent while to day it amounts to over 70 per cent

The goods carried are divided into three classes (No 1 2 and 3) the charge being respectively 5, 4 and 3 " fillers " per quintal per kilometre (about 0 22d 0 176d and 0 131d per cwt per mile) When the services were inaugurated the revenue only amounted to 60 fillers per kilometre (about 8 28d per mile) later to 120 fillers and at the present time to between 140 and 150 fillers per kilometre (from 19 32d to 20 7d per mile)

Motor 'Bus Services

of
M

the company owns ten Pullman 23 seated coaches, but a considerable enlargement of the fleet is being made ready for service next spring The vehicles provide travelling facilities for the public in districts where the railway services are poor, or entirely absent None of the bus routes exceed a distance of 50 kilometres (about 31¼ miles)

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I may add that on certain routes workmen and market people are carried at much lower fares to and from the market towns on the goods carrying vehicles on which benches can be readily fixed

Needless to say the increasing motor traffic demands good roads Hungarian roads have been in course of reconstruction for some years There are therefore great hopes that by the time the company's full programme is in operation the roads of our small country will be everywhere in such a condition that the company in conjunction with the railways will be able to meet the needs of transportation in every respect

Motor Transportation in French Northern Africa.

Prepared and submitted by M REGNAULT, Director and General Secretary of the Société des Voyages et Hotels Nord Africains

French Northern Africa, the territories of which extend to the Southern confines of Morocco and Tunisia, is a land where from the point of view of transportation, the motor vehicle is the undisputed king

In Algeria, for a great many years past motor traction has been extensively used, particularly by agricultural settlers, but it is mainly during the years succeeding the Great War that we have seen an intense development in the use of the motor car throughout the whole of Morocco as well as in Algeria and Tunisia This progress has been upon a scale never dreamed of or anticipated

The making of extensive and elaborate touring arrangements has not been one of the least factors in this development, but contemporaneously with the great flow of motor tourists from all parts of the world the native population of Morocco Algeria and Tunisia has shown a remarkable tendency to adopt motor traction This *penchant* has resulted in the provision of cars of big capacity and high speed These have been put into general use on the roads, and, right from the start, the native element has taken enthusiastically to them and the development of the public services has gone from strength to strength

It may be said that the early part of the year 1920 saw the first really great strides in the development of motor transportation in these lands

Each successive year North Africa has absorbed the latest models both of large vehicles for public conveyances and of private touring cars This applies both to the types of engine and chassis and to the bodywork

All this progress has taken place simultaneously with the construction of the railroad system of Morocco and the extension southwards of that system as well as that of Algeria

If this development of motor transportation has not harmed the progress of the railways, the same thing cannot be said of that once exclusive means of Saharan transportation, the camel— " The Ship of the Desert "

The various
new six-wheel
cars, and full [illegible]
of easy communication in the regions of the Far South

This form of locomotion, necessarily very costly, has nevertheless found its opportunity by reason of the facilities it offers to the tourist The effect has been that steadily, and particularly since 1924, each year has seen these cars employed more extensively in place of the former means of travel—the camel

To day it is possible, by means of these cars, to travel through the great dunes of the Sahara between Tuggurt and Tozeur *via* El Oued Oasis, such a journey occupying only two days as against the fourteen formerly taken by the camel

The journey of 1,400 miles round the sands of the Grand Erg Occidental takes but six days whereas a full month was once necessary

Finally, big game hunters may travel from Beni Ounif de Figig (head of the railway from Oran) to the banks of the Niger, to Gao Bamba, Burem and Timbuktu Such a journey, which in former days, was necessarily made by camel, then consequently fell to the lot of very few people

Mention must be made of the important services these vehicles have rendered in providing means of communication with the military posts of the Sahara Now and henceforth these can be easily revictualled and all difficulties of penetration into the interior regions and the opening up of those districts, arising from the difficult nature of the ground have now disappeared

Road Transport Conditions in Palestine.

Memorandum by the High Commissioner for Palestine

Submitted by the Delegate officially representing the Colonial Office

1 Road Construction and Improvement in Relation to the Development, Efficiency and Economy of Road Transport

The ordinary first class roads of Palestine consisted originally of water bound macadam roads without foundation of any sort These were found in certain cases insufficient to carry the traffic which they are called upon to bear and the following roads have been reconstructed or are in course of reconstruction

Jerusalem—Bethlehem—7 kilometres (4¾ miles) Hot grouted

Ramleh—Jaffa—20 kilometres (12½ miles) Hot grouted

Tel Aviv—Petach Tikvah—11 kilometres (6⅞ miles) Cold grouted

In all such cases the foundation laid down consists of 20 cm (about 8 in) of stone pitching—with haunch stones at sides to prevent spreading—covered with 12 cm (about 4¾ in) of macadam and grouted with either hot or cold applications of bitumen

Hot grouting is carried out with the local equivalent of Mexphalt and Spramex Cold grouting is of the semi-penetration class and is carried out with a local product of fluxed bitumen All bitumen has recently been obtained from the Suez Refineries of the Asiatic Petroleum Co

In addition to these major works of reconstruction, much work has been done in straightening out bad curves on roads and in widening and super elevating other curves Super elevation has appreciably reduced maintenance required on such curves and danger to traffic using the roads

During the long summer months Palestine roads are very liable to work loose and break up This is overcome by spreading and maintaining an earth coating on the road surface during that season This earth coating is, however very liable to corrugate on certain sections of the roads, and such corrugation is gradually transmitted to the metalled surface underneath resulting in rapid deterioration of the roads Experiments are now being carried out with a view to the elimination of this rapid

deterioration by cold grouting those sections of the road most liable to corrugation and by omitting the summer coating of earth

The following figures show the increase in the length of the main roads of Palestine over the period stated

	1921	1922	1923	1924	1925	1926	
Roads suitable for motor traffic in all seasons	460	485	570	580	600	630	Kilometres
	287½	303	356¼	362½	375	393¾	Miles (Approx)

Motor vehicles were not used in Palestine previous to the war The figures shown hereunder indicate the increase in this form of transport during recent years

Date	Cars and Lorries	Motor Cycles	Total
July 1924	843	48	891
April 1925	1 226	108	1,334
December 1925	1 610	144	1,754
December 1926	2 113	193	2,306

2 Motor Transport as an Instrument of Development of World Resources

Little has been done in the development of the cultivable land by motor services with the exception that motor ploughing is now considerably on the increase In the case of large towns such as Jerusalem, Jaffa, Tel Aviv, Haifa, where suburbs are gradually being built outside the limits of the town, the need for transport is being met by the installation of motor bus services

3 The Necessity for Co operation between Road and Rail Transport

The railways of Palestine are Government owned, but with the exception of a small motor 'bus service at Haifa worked by the railway authorities nothing has been done by Government to develop motor services in direct conjunction with railways The tendency is for private 'bus and lorry services to compete with railway transport especially with regard to the transport of oranges which are now largely conveyed direct from groves to quay by motor lorries

4 The Development of Motor Vehicles Suitable for Service on Bad Roads and for Cross Country Use

Six wheel or creeper track motor vehicles are not in use in Palestine, but the Transjordan Frontier Force have been recommended to invest in Morris six wheel trucks to meet their transport requirements over very rough country

5 The Improvement of Facilities for International Travel by Road

A little has been done in the way of sign posting on Palestine roads Regulation danger signs are now on order, and it is intended to instal these at an early date

In Palestine all vehicles drive on the right hand side of the road In large towns traffic is regulated by the aid of the police who are stationed on point duty in the most congested areas

Steamship charges for conveyance of motor vehicles to Palestine are high presumably due to lack of competition on the part of the steamship companies serving the country

Customs Formalities A duty of 15 per cent is charged by the Customs Department on all motor vehicles entering Palestine If a visitor brings his car and leaves the country within six months taking the car with him the Customs charge is considered as a deposit and is refunded on leaving the country

Tourists usually arrange for hire of local transport either by direct application to one of the firms catering for transport or through one of the numerous tourist agencies established throughout Palestine

6 Fuels and Fuel Supplies for Motor Vehicles

No effort has been made to use fuels other than petrol in connection with motor transport Road rollers are driven by steam or paraffin engines *A road roller driven by crude oil is being* used by the Public Works Department and orders have recently been placed for three additional rollers of this type

Some Notes on the Part Played by the Motor Vehicle in the Development of Transport in Iraq.

Prepared and Submitted by Muzahim Bey al Pachachi, Diplomatic Agent

The motor vehicle has been one of the most important factors in the progress that Iraq has made since the war It would not be too much to say that it has filled a unique role The Government is fully alive to its utility in opening up the country, and the construction of roads—which thanks to the easy contours of the great river valleys offer no particular difficulties—is a constant subject of attention

There are to-day some 3,650 miles of roads in Iraq suitable for motor traffic These are distributed as follows —Northern Iraq, 1,350 miles, Central Iraq, 1,750 miles, Southern Iraq, 550 miles The utility of the motor vehicle is already understood by all classes Imports since 1923 are as follows —

	No of Vehicles	Value (Rupees)
1923 24	210	3 59,587
1924 25	482	8 80,292
1925 26	654	10 58,264
1926 27	725	13 49,541
April August, 1927	454	10 37,419

Railways in Iraq do not show so great a development as the roads, the total mileage being 805 69, of which only 186 65 is standard gauge It follows that the roads penetrate to many places which the railway does not reach When both serve the same districts competition between the two is severe Thus, round Baghdad there is competition to the north east for 200 miles, to the south west for 64 miles, and to the north for 132 miles On the whole, rail fares for third class are slightly above those of road vehicles for the same distances, whilst first class fares are more considerably above those for motor road travel The Railways have lowered their fares in places where the competition is specially severe, and it should be remembered that, whilst travel by motor vehicle is the more popular amongst business men, their activities tend to bring more freight traffic to the railways In general one may say that, whilst motor traffic will always play a part of capital importance in the economic development of the country, railways will also become more necessary as wealth and population grow

The roads of Iraq pass through two distinct phases each year From April to December they are generally good and capable of

allowing motor vehicles to attain comparatively high speeds Absence of culverts and bridges, however, make careful driving necessary at all times From December to March, during the rainy season, the roads become well nigh impassable for days at a time, and as they dry rapidly they are left in very rough condition The Government, however, is fully alive to the necessity of improvement, and so far as its means allow is doing its best to secure this

The types of motor vehicles best suited for Iraq are those with a high clearance, good reserve of power, and as dust proof as possible Motor vehicles are to a great extent owned by small companies, or by individuals with small capital, and the fares charged have to be low The cost of vehicles to the purchaser in Iraq should therefore also be relatively low

Special mention should be made of the fact that communications pend on the motor vehicle, its on vice to Cairo There are three Damascus is the quickest, and takes generally about 20 hours, a halt being made for the night at Rutba on the frontier of Iraq The journey can, however, be done much quicker than this under favourable circumstances, and it has been accomplished in a single day Another route is that through Palmyra to Damascus, slightly longer but more picturesque The third is from Mosul to Aleppo, which takes about 20 hours

The following table shows the number of various motor vehicles registered in Iraq on September 30th, 1927 —

Make of Vehicle	No
Ford touring cars	1 970
Ford vanettes	153
Ford vans	30
Ford one ton trucks	148
Graham vans	7
Touring cars	789
Light transport vehicles (Fiat, Chevrolet, Dodge, Renault etc)	102
Heavy transport vehicles (Peerless Albion, etc)	113
Fordson tractors	31
Fordson trailers	2

As regards touring cars, of the 789 registered, 710 were of foreign and 79 of British construction These are other than Ford cars, which are shown separately in the above table The most numerous makes were as follows —

Chevrolet	168	Crossley	28
Overland	89	Fiat	27
Buick	85	Studebaker	27
Dodge	65	Chrysler	23
Hudson	52	Essex	20
Citroen	48	Rugby	15
Renault	31	Morris Cowley	7

In the heavy lorry class there were 50 British as compared with 83 foreign. Of the British the Albion with 13 came first, the Talbot were second (7) and the Scammell third (5). Of the foreign makes Peerless came first (55) and F W D second (21).

The registered transport companies in Iraq are —1 Nairn and Eastern Transport Company, 2 Kawath and Tawil Transport Company, 3 Hassan Makhsoumi Transport Company, 4 Hassa Al Huss Transport Company, 5 Adib Shaban Transport Company, 6 Akaboff Transport Company, 7 Sayid Hamid al Naqib Transport Company.

The first six companies normally operate a bi-weekly service between Iraq and Syria, which is increased in the busy season. The service to Persia depends on demand and emergency. The last named concern runs one weekly journey between Basrah and Koweit, it being only made more frequent if the number of travellers warrants.

Road Construction and Improvement in Relation to the Development, Efficiency and Economy of Road Transport.

By Major R A B SMITH A C G I

Submitted on behalf of the Commercial Motor Users Association

In the first instance one must approach this problem from two angles that of densely populated areas and that of sparsely populated areas With reference to the first a portion of these are already built up and the question is how to deal with them satisfactorily Parking places are the main difficulty and these must be provided At present the tendency is for big cities to concentrate their distributing centre for passenger traffic at one point For instance we have a tram and bus centre at Liverpool and Manchester and at other towns This at once leads to congestion and it would be far better to split them up into four points north east south and west distributing respectively to the four quarters of the town Near by each of these centres should be a private car park

Once these facilities are provided parking of cars in streets should be prohibited and this would not cause inconvenience to the workers Through traffic in what has hitherto been a congested area would be facilitated and the death roll due to accidents considerably reduced

Where a city is not yet fully laid out the matter requires very careful consideration In the case of Glasgow the system of laying the streets out in squares was adopted—admirable for traffic travelling due north east west or south but extremely difficult for traffic travelling at an angle to any of these points Nor does a system of circles satisfy the requirements of vehicles travelling in all directions It is obvious that a combination of these two systems and diagonal streets tends to more ideal conditions

In suburban areas where building is in progress certain definite rules should be laid down The exits to all side streets should be either bell mouthed or at any rate one and a half to double the width of the remainder of the street The residential or dormitory area should not be built along the main roads but in districts between them This gives peace and quietness and at the same time reduces the chance of through traffic running into groups of children playing on the highway

As we get further away from the town the lay out of the roads can be more freely developed Every side road when entering into a main road should be double its width for at least 200 yards before the junction This will allow traffic to continually trickle through, and if there are two side roads entering into the main road at the one point will allow two streams of traffic to get away when the signal is given

Cross roads should be avoided as much as possible but where they exist an automatic signal should be installed A refuge should also be provided as children would soon learn they should only cross when the green light shows in their direction

By-pass Roads

The adoption of by-passes should be made compulsory The argument that trade is carried away from the town is obviously foolish If the trade exists it is because there is a customer, and that customer must go to town to satisfy his requirements The through traveller has just as much right to consideration as the local draper or baker Maidstone is an example of the extreme inconvenience that can be caused by forcing through traffic into the town the writer has experienced the real difficulty that exists if one desires to stop there whereas if the through traffic were dismissed, *shopping would become a pleasure*

In designing by passes more thought should be given to the approach at either end Very often a splendid opportunity arises for dispensing with a dangerous corner or cross road, but too often that opportunity is neglected and a cross road deliberately engineered No by pass should be approved until the possibilities of a second have been thoroughly examined, and, if possible, the second should be planned at the same time even though not constructed By this means an orderly town will spring up around a disorderly centre, and eventually there will be sufficient through roads to distribute the traffic to such an extent that further costly by passing will be unnecessary, for it must be remembered that each succeeding by-pass is likely to be half as long again as the last and proportionally more costly

The Improvement of Roads

An interesting indication of the effect of improving roads on their increased use by motor traffic is at Athens Four years ago there were about 5 000 motor vehicles in the whole of Greece During the last four years the roads have been improved in the neighbourhood of Athens with the result that the number of motor vehicles has increased to 15 000, and it is quite obvious that as the road development is increased the number of motor vehicles will increase still more rapidly

Some interesting figures were published a year or so ago showing that in the United States motor vehicle registration increased at a far greater rate than did the expenditure on highway construction and improvements While the percentage increase in money expended on highway construction had been

only 500 per cent in 10 years the percentage increase in motor vehicle registration had been in the neighbourhood of 2 500 per cent

That the same thing is occurring in England is shown by the following figures —

ANNUAL ROAD COSTS

Year	Expenditure by Local Authorities		Paid direct by Ministry of Transport	Annual Road Costs	No of Motor Vehicles and Motor Cycles Registered
	From Current Revenue	From Loans			
	£	£	£	£	No
1920–1	41 557 037	4 101 414	24 400	41 581 437	916 000
1921 2	45 431 026	7 359 184	443 971	45 874 997	942 000
1922–3	44 482 758	10 035 245	1 310 666	45 793 424	1 094 000
1923–4	46 100 570	9 447 844	877 530	46 978 100	1 289 000
1924 5	51 135 603	10 890 131	1 150 562	52 286 165	1 501 000

The use of foresight in main road construction has been seen in Ireland where a century ago a Broad Roads Commission was formed and as a result of which certain definite links as near as possible straight lines were constructed between the biggest towns A 100 ft strip of land was purchased in each case at a very low figure the actual carriageway contructed was about 30 ft wide and in many instances owing to the troubles of that country leading to very little money being available the width of the actual carriageway was reduced Nevertheless now the situation is improving these carriageways are again being widened merely at the cost of the material necessary for the widening with the result that at a very small cost the highway authorities are able to cope with the increasing traffic This principle has only comparatively recently been adopted in Great Britain an example of which is the Kingston By pass (see illustration Fig 1)

MODERN AMERICAN ROAD PLANNING

The United States are going a step further and an interesting development which will have to be considered in parts of Great Britain is that adopted in Wayne County in which is situated the City of Detroit the home of the American car industry Here the Board of County Road Commissioners realising that half measures are useless have adopted an entirely new plan In this scheme the Board is co operating with the Detroit Rapid Transit Commission and the Road Commissions of two adjacent Counties—Oakland and Macomb At first sight the plan may seem very bold but it must be remembered that in the past traffic requirements have always been under rather than over estimated

The scheme covers an area within a fifteen mile radius of Detroit The area has been surveyed and a system of roads known as super highways laid out There will be a cross road every three miles having a width of 204 ft The main arteries out of Detroit will also be of this width At mile intervals between these super highways there will be roads built with widths of 120 ft while at half mile intervals there will be roads constructed with 86 ft widths

The roads at the half mile intervals or 86 ft roads will have two carriageways each 20 ft wide with a centre portion 20 ft wide for local traffic or for additional width of carriageway The remaining 26 ft is taken up by footpaths shoulders and parkway

The 120 ft roads will have a central carriageway having a minimum width of 40 ft to cater for high speed traffic Outside this through traffic route will be a 5 ft parking strip and then



FIG 1 KINGSTON (SURREY) BY PASS SHOWING PROVISION FOR WIDENING AT A FUTURE DATE

a 20 ft carriageway for local and slow speed traffic At the margins there will be a 15 ft space for shrubbery and footpath

On the super highways there will be added to the 120 ft width described above an additional width of 84 ft for rapid transit rail facilities The through traffic roadways each 20 ft wide will then be placed on either side of the railway track Outside of [illegible] strip then the 20 ft [illegible] otpath area

At the [illegible] tracks will cross at three different levels in order that no delays will be caused

A competition was recently held in the United States for the best design for the construction of 200 ft wide super

highways to serve Chicago's metropolitan area The design specially allows for the construction to be progressive commencing with a 20 ft carriageway only When completed the road will be in halves all traffic travelling in the same direction on each half Commencing from the centre of the road first there will be the tramway track followed by two tracks for fast traffic one track for medium speed traffic one track for lorry traffic a track 17½ ft wide for parking lorries whilst they are delivering their loads and finally the footpath

It is interesting to note that in Great Britain Liverpool and other towns as depicted in Fig 2 have already adopted a system of double carriageways with the tram lines laid between them

Generally speaking no highway should be less than 20 ft and should be designed so that it is a perfectly simple matter to add

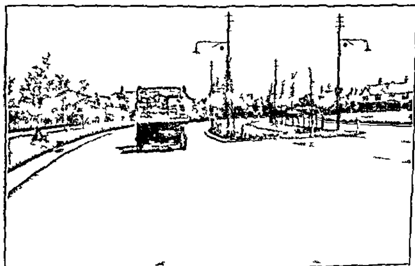


FIG 2 AN EXAMPLE NEAR LIVERPOOL OF DOUBLE ROADWAYS WITH TRAMWAY TRACK BETWEEN

another 10 ft strip in the near future In other words every bank or fill should be constructed to carry a 30 ft carriageway although only a 20 ft carriageway is to be constructed for the moment and of course the same applies to the construction of new bridges

WHITE OR BLACK LINES ON ROADS

There is a great deal of difference of opinion in the different areas as to the use of the white or black line The writer is of the opinion that on concrete surfaced roads at any rate the black line has proved its efficacy not merely at corners but throughout the whole length of the road The black line un

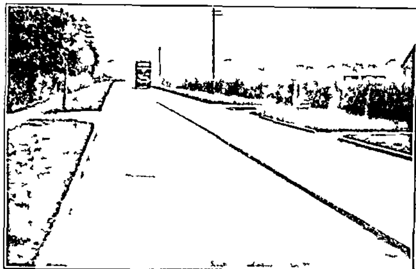


FIG 3 WARLINGHAM SANDERSTED ROAD SHOWING HOW TRAFFIC IS GUIDED BY THE CONTINUOUS BLACK LINE IN CENTRE

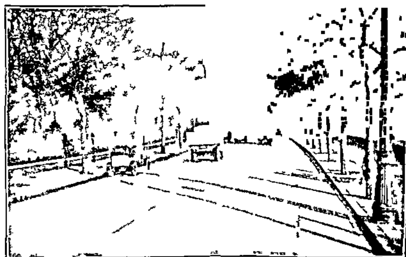


FIG 4 VIEW OF THAMES EMBANKMENT CHELSEA LONDON SHOWING ROAD SURFACE DIVIDED INTO FOUR 10-FT STRIPS

the latter case the road is 42 ft wide, there are four strips, and it is noticeable that the slow-moving traffic keeps in the strips adjacent to the kerbs

This also suggests the possibility of adopting a method which is employed in the United States During the rush hours three 10-ft strips are given over to traffic travelling in the main direction and one strip to that travelling in the other direction By this method the whole of the road is used by the traffic with the minimum amount of waste of space

The Super Elevation of Roads

The proper super elevation or banking of all curves—an example of which near London, is depicted in Fig 5—would remove the biggest danger of all, as there is not the slightest doubt that to day in nine cases out of ten the motorist is driven to hugging the crown of the road or even getting on to the wrong side in order to hold the road No doubt it is wrong, neverthe

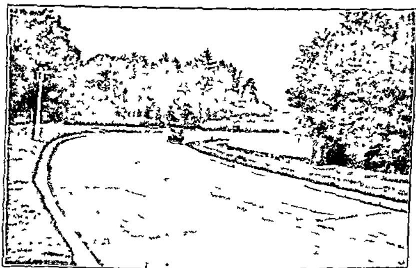


FIG 5 SUPER ELEVATION ON ROAD NEAR LONDON

less, many do it and after all, the spirit of self preservation is keenly alive and the motorist prefers the chance of a collision to the surety of a skid and its consequences

Another danger is the existence of a number of old bridges built with a high rising arch which considerably reduces the range of vision of motorists travelling in either direction and in some cases retards the view almost as much as does a corner An example of such an undesirable form of bridge is depicted in Fig 6 It is important that all road bridges should be constructed with the approaches at a gradient not exceeding 1 in 30

The Foundations of Roads

In industrial countries it is essential that foundations of all roads should be capable of carrying the increased traffic. This can only be accomplished by constructing them of concrete and in view of the proved value more particularly in the United States of the *concrete surfaced road* it is a reasonable proposition to construct these concrete bases with a little more care and at perhaps a little greater expense, so that it is possible to run traffic over them for a certain number of years before imposing what is known as a surfacing material.

As far as economy is concerned the following figures are available —

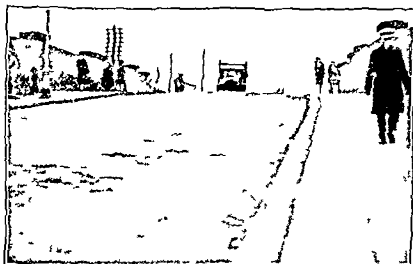


Fig 6 Example of a Badly Constructed Bridge Showing Restriction of View

Department of Public Works Division of Highways
Albany N Y

Data Covering the Average Maintenance Costs of Various Types of Road Surfaces in New York State for Periods 1922 to 1926

	1922 £	1923 £	1924 £	1925 £	1926 £
Bituminous Macadam Penetration Method Asphalt and Tar	122	59	169	203	185
Topeka on Concrete Base	73	66	109	119	145
Topeka on Macadam Base	146	171	274	282	246
Waterbound Macadam	155	179	183	200	212
Brick	61	70	85	113	146
First Class Concrete	45	44	67	82	97
Second Class Concrete (i e mixes weaker than 4 2 1)	138	146	216	228	209
Gravel	146	163	237	324	178
Average of all Types	£111	125	168	194	177

In agricultural countries and areas such as one finds in South Africa and the Argentine the development of the highway system cannot progress on the same lines as in Great Britain and the United States, the money is not available neither is it necessary The roads to be developed should be those radiating from the railways and the trunk roads should only be developed

RELATIVE COSTS OF VEHICLE OPERATION ON VARIOUS CLASSES OF ROADWAY SURFACE

Type of Surface	Type and Speed of Vehicle			
	Solid Tyre Trucks 10 m p h	Pneu tyre Trucks 10 m p h	Cars 20—30 m p h	Motor Buses 25 m p h
	Cost per ton mile	Cost per ton mile	Cost per ton mile	Cost per ton mile
	Pence	Pence	Pence	Pence
Average Portland cement concrete and asphalt filled brick	4	4	5	12
Best Portland cement concrete and asphalt filled brick	3¾	3¾	4¾	11¼
Best gravel yearly average	4¼	4½	5½	12¾
Ordinary gravel yearly average	4½	4¾	5¾	13½
Waterbound macadam well maintained	4¼	4½	5½	13
Bituminous macadam well maintained	4¼	4½	5¼	12¾
Average sheet asphalt yearly average temperature	4	4¼	5	12
Average asphaltic concrete yearly average temperature	4	4¼	5	12
Best earth well packed by traffic	4½	4¾	6	13½
Ordinary earth with light traffic	4¾	5	6¼	14¾

As far as expenditure is concerned in the first instance only the bad ground should be treated with permanent forms of construction the remainder of the roadways should be constructed on the cheapest possible method using present day surfacings without expensive foundations It seems reasonable therefore in these outlying areas that there should be a restriction on the load of, say 5 tons per axle In the United States the load restrictions are based on the inch width of tyre and generally vary between 400 and 800 lbs per inch In some cases these maximum loads are reduced by 50 per cent in winter time

With regard to the cost of transport on various types of road the figures in the table on the preceding page and in that below are available as to tyre wear and petrol consumption and these must be taken into account when deciding upon the form of construction to be adopted

AVERAGE TOTAL ANNUAL COST OF TRANSPORTATION PER MILE
(Assuming 90% of Vehicles are Cars 5% Pneumatic tyred Trucks and 5% Solid tyred Trucks)

Average No Vehicles per day	100	250	500	750	1 000	1 500	2 500
Average No tons per day	150	375	745	1 120	1 500	2 250	3 [illegible]00
	£	£	£	£	£	£	£
Ordinary Earth	1 064	2 570	5 116	—	—	—	—
Best Earth	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	—
Ordinary Gravel	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	—
Best Gravel	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	22 196
Waterbound Macadam	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	22 822
Bituminous Macadam	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	21 934
Sheet Asphalt	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	20 734
Asphaltic Concrete	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	20 696
Average Portland Cement Concrete	1 152	2 368	4 396	6 026	8 462	10 514	20 614
Best Portland Cement Concrete	1 100	2 238	4 134	6 032	7 936	11 726	19 302
Vitrified Brick	1 238	2 446	4 478	6 506	8 538	12 596	20 686

The time is rapidly arriving when the onus for providing non slippery roads should be the legal responsibility of the Authority concerned There is no excuse to day for a slippery surface Non slippery surfaces can be obtained by the adoption of concrete surfaced road or by proper treatment of the more resilient types Probably if one or two decisions were given against the responsible Authorities where slippery roads are in evidence slippery roads would cease to exist although, of course it is impossible to avoid slipperiness when leaves are falling or rain turns to ice immediately it has fallen

The National Good Roads Movement and the Development of Motor Bus Services in China.

Prepared and submitted by TSOOMING CHIU on behalf of the Chinese Ministry of Communications

In ancient China roads were built for military purposes Later on the road system was maintained for communications between the Central Government and Provincial Governments for political purposes At the end of the Manchu dynasty (1911) we possessed 2 000 miles of Imperial roads radiating from Peking to connect with all provincial capitals Recently we came to realise that communication is the forerunner of political financial and industrial progress To help agriculture and industrial development by means of communications is a national slogan A national good roads movement of China was launched in 1921 The Association for that purpose was set up in Shanghai its object independent of parties and Government, being to advocate the building of good roads throughout China A very well elaborated plan of road building which classifies the projected roads into national provincial and district was drawn up and was to be carried out either by national and local Governments or by the people themselves

Despite the internal disturbances from 1917 the good roads in China are increasing year by year In June of 1926 the number of motor roads in each province and their length in li (one third mile) is as follows —

Province	No of Roads	Li	Province	No of Roads	Li
Chihli	22	3 515	Huaan	3	463
Kirin	2	29	Shensi	1	[illegible]90
Shantung	24	5 392	Kansu	2	694
Honan	36	2 629	Szechwan	3	38[illegible]
Shansi	9	2 462	Kwangtung	22	1 416
Kiangsu	25	2 665	Yunnan	1	100
Anhwei	11	1 095	Fengtien	11	1 101
Kiangsi	2	235	Kwangsi	10	498
Fukien	18	1 092	Other territories	10	8 970
Chekiang	11	671			
Hupeh	11	3 392			

During recent years the development of motor bus services in China has been most striking and remarkable When I left China in 1922 I hardly heard of motor bus services So far as my

memory goes the motor service between Kalgan and Urga was then the only regular motor service. When I returned to China last year I was greatly surprised to find that motor bus services are so numerous and so popular. I am sorry to say that I received the instruction to represent China at this Congress only ten days ago, so that it is not possible for me to present a complete list of motor bus services existing in China. Nevertheless I have completed the following list of such services established during the year 1926, by which I hope you may realise the remarkable progress motor transport has made in China.

MOTOR BUS SERVICES ESTABLISHED IN CHINA DURING 1926

1 Chengtu Kwanhsien (87 miles)
2 Chinkiang—Yangchow
3 Haining—Changan (Chekiang Province) (6 miles)
4 Heiho—Tsitsihar
5 Huchow Motor Service
6 Siangtan—Changsha
7 Siangtan—Siangsiang (Hunan Province)
8 Kaiping—Newchwang (via Yingkow)
9 Kalgan—Dolonor (200 miles)
10 Kalgan—Pingtichuan (170 miles)
11 Kalgan—Urga (800 miles)
12 Kiukiang—Kuling (18 miles)
13 Lingyuan—Sinchung
14 Manchouli—Urga
15 Paotowchen—Ninghsia (400 miles in three days)
16 Peking—Lwanchow
17 Pengpu—Hofei
18 Pingtichuan—Pangkiang (250 miles)
19 Shaohing—Chenghsien (70 miles)
20 Shanghai—Chwansha
21 Shanghai—Tsimpu

Construction and Improvement of Roads in Germany.

Communication from Die Studien Gesellschaft fur Automobil Strassenbau (German Motor Road Construction Research Association)

The German highway system comprises about 210,000 kilometres (131,250 miles) of roads These are divided into two main groups for the purpose of the division of costs of maintenance State (or, in Prussia, provincial), roads on the one hand, and county (Kreis) roads on the other hand The first group comprises about 90,000 kilometres (56,250 miles) of roads, the second about 120 000 kilometres (75 000 miles) The State or provincial roads have generally speaking, the more important traffic Here the course of development shows that in the industrial regions of Western Germany which have developed more quickly with their heavier and more congested traffic, the State or provincial group of roads have advanced ahead of the roads in the Eastern parts of Germany with their thinner local traffic, which is chiefly agricultural

The traffic on the German State and provincial roads was counted by a traffic census of the German Road Construction Research Association in the period from October 1st, 1924 to September 30th 1925 There was found to be an average daily total traffic of 323 tons which was considered to be equally divided over this road system From these 323 tons, 163 tons, or about 50 per cent are made up of horse vehicles, 70 tons, about 22 per cent consist of motor cycles and motor cars and 90 tons or about 28 per cent of motor trucks and unusual loads The heaviest traffic was shown by the State of Hamburg, 36 4 per cent of whose road system which is only 11 kilometres (about 7 miles) (sic) long has to carry a daily load of traffic of over 2 000 tons Next comes the Rhine Province which is an administrative district of a large area comprising about 6 000 kilometres (3,750 miles) of provincial roads, of which about 220 kilometres (137½ miles), or 3 6 per cent, carry over 2,000 tons The horse traffic in Germany still amounts to about 50 per cent of the total load in spite of the rapid increase of motor traffic in the post war period, a position of affairs which has to be taken into account in the method
method of road
according to the
purpose the lo
roads which hac
sections, that is to say, where the foundation was damp, small paving stones were already in use before the war For very

heavily loaded sections large paving stones were used. In villages cheap cobble stones were often employed. The changes in the nature of the demands made upon the roads owing to the appearance of motor traffic caused the former methods of maintenance to be largely given up. The methods chiefly used in Germany at the present time are, firstly, small paving stones, and, secondly, a bituminous surface layer of waterproof metal, the former being adopted in consideration of many years of satisfactory experience and the layer of bitumen because of its low cost. The small paving stones are used on account of cheapness and durability for much used roads, the bitumen surface for the lesser used. Apart from these surfaces of heavy or fairly heavy layers of asphalt and tar macadam are now also largely used.

In adopting new methods of surfacing, the provincial or State roads take the lead. In 1925 about 80 per cent of the 120,000 kilometres (75 000 miles) of county roads were unsurfaced, 3 1 per cent were surfaced and 2 62 per cent were of small paving stones. The remainder consisted of various surfaces, mostly of old-fashioned paving. Of the 28,000 kilometres (17,500 miles) of Prussian provincial roads in April, 1926, only about 73 5 per cent were unsurfaced. About 5 per cent had thin surfaces, about 11 per cent were paved with small stones, while the remainder had various surfaces, chiefly old fashioned paving. In the matter of the extension of the use of small paving stones in Prussia, the Province of Hanover, in which this method of construction was invented and developed, takes the lead. In comparing all the German provinces with each other, that of Brunswick shows, on about a quarter of its road system, by far the largest use of small paving stones up to now. The greatest use of light bituminous surfaces is to be found in Prussia, and the Province of Brandenburg, where owing to the enormous motor traffic which radiates from Berlin into this province, a quick and comparatively cheap method of changing the surface had to be found. Bavaria also prefers lighter forms of surfacing for the quick repair of roads.

The German administrations are now engaged in the production of a joint programme of construction for the whole of Germany, by which the road system, which was prevented from

present calculated at 360 million Reich marks (approximately £18 million) annually. This maintenance cost can be reduced, possibly by nearly a half, according as the programme of construction is proceeded with. A period of ten years is allowed for the execution of this programme.
Reichs motor tax
to the provinces fo
in during the year 1927 an amount of 150 million marks (£7,500,000). The deficit will be covered from State and communal taxes. For the carrying out of the construction many

loans have been raised by the States and Provinces The programme of construction falls into four main groups—the extension of the lay out an

the existing insufficiently surfaced or unsurfaced thoroughfares into medium or heavy modern surfaces to be chosen according to the requirements of the traffic

The widening of the roads means the construction of a road wide enough for at least two streams of traffic at such places where the stream in both directions is so thick that if a vehicle is forced under present conditions to leave the line of traffic to overtake another or to cross the road it holds up the traffic and becomes a danger

The aim of the improvement of the lay out will be to remove sharp curves especially steep inclines and blind corners it will

Lastly the enlargement of villages aims at replacing such existing roads as are found to be too narrow or have an old fashioned surface by a road in most cases of heavy material with a sufficiently wide surface well built up sides and good drainage

The Highway Situation in the Union of South Africa.

Prepared and Submitted By J W WALSHAW Joint Hon Secretary, South African Good Roads League

South Africa as far as highways are concerned is comparatively speaking still in its infancy It must not be assumed, however that motoring presents insuperable difficulties In a total white population of approximately 1 600 000 there were 84 212 motor cars and nearly 112 000 motor vehicles altogether registered at the end of 1926—a figure that places the Union fifteenth on the list of world registrations of cars trucks and buses To this figure must be added 27 656 motor cycles It will be noted from these figures that on a per capita basis South Africa ranks high among the motorised countries of the world Obviously this could not be so were road conditions as appalling as they are sometimes depicted to be in foreign countries

Road legislation varies somewhat in the four Provinces—The Cape Orange Free State Transvaal and Natal In every Province roads within municipal areas are constructed and

the roads are made and of Divisional Councils The funds for such work are mainly derived from rates on fixed property and subsidies from the Provincial Administration It has not been the general practice in the Province to construct roads out of loan funds but out of revenue

In Natal the main roads are constructed and maintained by the Provincial Administration There is no local co operation save in regard to purely local roads which are kept in order by farmers in the locality on a £1 for £1 basis the grant being paid after inspection by the Provincial Road Engineer Funds are derived mainly from revenue but in some cases loan funds on a ten year basis of repayment have been employed

In the Transvaal and Orange Free State—as in Natal—funds for road work are supplied by the Provincial Administrations Unlike Natal however, they have Road Boards which voice local opinion in regard to expenditure of money on roads in each road district The powers of these boards is very limited In both Provinces loan funds have been employed to a very limited extent

The mileage of roads in each Province to which official recognition has been given is as follows —

Cape	32,500
Transvaal	20 000
Orange Free State	10 400
Natal	6 200

During the past four or five years the Transvaal Roads League and its successor, the S A Good Roads League, has carried out very extensive propaganda work regarding the need for an improved and remodelled road system The League was largely responsible for the establishment of a Union Government Committee, appointed to examine and report upon the position The Committee issued a report which endorsed the recommendations of the League that roads should be reclassified into —1 National Roads 2 Provincial Main Roads 3 Provincial Branch Roads (i e Local Roads) Municipal roads to remain as before

Class 1 would be constructed and maintained by the Union Government

Class 2 would be subsidised by the Union Government to the extent of one third of the cost of construction only Facilities would be granted to Provincial Administration to obtain long dated loans for construction maintenance to be met out of revenue

Class 3 would be built and maintained by local authorities under their own financial arrangements

This report of which the above is the outstanding feature was not accepted by the Government In a subsequent debate in the House of Assembly a resolution which virtually meant the adoption of the report was lost by two votes only Interest in roads has so developed that signs are not lacking that before long the Union will enter upon a real Road era

From this it must not be imagined I predict the building of expensive types of paved roads The slogan of the League is We Want Good Roads — Good Roads ' meaning ' Roads within our means and to suit our needs Our needs are comparatively light and it is obvious to the student that a good earth and gravel road system is all that is necessary The more extended use of suitable machinery and the employment of some form of patrol maintenance should provide such a system at reasonable cost

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The Development of Motor Vehicles Suitable for Service on Bad Roads and Across Country.

Submitted by the British War Office

Prior to 1914 the development of the ordinary commercial motor vehicle was so much in its infancy that the need for a machine to negotiate anything but a made up road had not been considered except to a limited extent for agricultural work, and that hardly at all in the United Kingdom At home the cross country machine was still represented by the steam tractor with a winding rope attachment

During the war, the campaign in France did not forcibly demand any special types of vehicle, as the roads were extremely numerous and comparatively speaking, reasonably good Even then the construction of temporary tracks such as the corduroy road was found necessary for certain operations Leaving out the Tank, for the few cross country vehicles we did require (heavy and medium gun tractors) we had to look to the United States, with only qualified success Other theatres were even more handicapped owing to their needs being made subservient to the main theatre in France

The campaign in Italy and work on the north west frontier of India showed us that our home produced vehicle could not compete with those of other countries designed for the special conditions called for, namely, long, comparatively easy gradients with numerous hair pin turns

It was the Chanak expedition in 1922 which brought home to us the necessity of producing for Army needs something lighter and better adapted for indifferent roads than the stereotyped solid tyred heavy lorry in general use in the United Kingdom

At that time the lesson offered by the development of the railway engine had not been digested to any great extent by the motor vehicle manufacturer, namely the advantage of spreading the load over a number of driving wheels Thus only two means of achieving the desired results were open —

(a) Lightening the load as far as practicable to reduce sinkage, (b) fitting pneumatic tyres to increase adhesion Man power and length of columns placed a limit on (a) or no doubt a vehicle of the Ford van type would have been adopted, as at that time, apart from the track machine, it was the best cross country performer The result was in 1923 the War

partment subsidy 30 cwt lorry—a vehicle which has set a fashion for light speedy reliable haulage even on the good roads abounding in this country

The intention was to make up for the loss of carrying capacity over the 3 ton vehicle by the provision of a trailer This however militated against the cross country performance and was capable of employment only under certain conditions

FLEXIBLE TRACK VEHICLES

In 1924 and 1925 the French showed the world what could be done in the way of cross country performance by a vehicle specifically designed for negotiating a particular type of country with the first of the trans Sahara expeditions

Actually the first vehicle to compete successfully with this undertaking was the Citroen Kegresse employing as is well known a flexible rubber track originally designed by a Russian engineer for use in snow Though successful in certain circumstances this device has its limitations and finality has perhaps not yet been reached The second type of vehicle to cross the Sahara was the Renault six wheeler which immediately focussed

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SIX WHEEL VEHICLES

In 1925 a sample Renault machine was purchased and tried out by the military authorities with such success that development in Great Britain was decided upon

Good as was the general principle of the Renault there were certain technical features lacking both in it and in any other machines of the type up to that time produced either in this country or the United States which trial proved to be very desirable for extreme conditions of cross country work

A design for the rear bogie of a six wheeled vehicle was undertaken by the War Departmental experimental staff at Aldershot incorporating these features and it was decided to approach manufacturers in this country with a view to production

In April 1926 the first six wheeler incorporating this design was satisfactorily tried out by the Army—a machine built largely of units standard to the firm s normal four wheeled vehicle and produced from drawing board to road test in three weeks

The leading features of this machine are well known and need not be dwelt upon here except in so far as to stress two points The provision of a greater number of driving wheels under the load—actually eight wheels in the War Department design—and the use of pneumatic tyres gave such remarkable adhesion that it was found possible to increase the tractive effort to an extent hitherto impracticable by the use of two gear boxes the second of which enables the main gear box to be utilised satisfactorily both on the roads and on heavy going The second point is

Realising the advantage the track—or half track—machine possesses over any wheeled vehicle under extreme conditions, a form of overall chain or track encircling each pair of twin driving wheels on either side of the vehicle was introduced, thus further increasing adhesion and utilizing to the full the tractive effort

The Army—and the Empire if it will—is now provided for the first time with a really satisfactory all round vehicle, capable of carrying on the road a load similar to the 30 cwt pneumatic-tyred lorry and a slightly reduced load across country at a running cost comparable with that of the tradesman's van

For military needs the two factors of man power and length of column on the road still awaited solution These would only be met by an increase of carrying capacity Hence the raison d'etre for the War Department subsidy medium six-wheeler This machine incorporates all the technical features of the lighter machine whilst doubling the carrying capacity both on and off the roads and as is known is in production by the majority of the leading commercial manufacturers of Great Britain either tentatively or in reality Several firms already hold the War Department subsidy certificate

THE DEVELOPMENT OF THE CROSS COUNTRY VEHICLE

The growth and development of the cross-country vehicle does not stop here Already the 5/6-ton machine is in being, and further increases of carrying capacity may be looked for up to the limit of gross vehicle weight imposed by the Ministry of Transport regulations By that time we may look for a further development in the number of load carrying and driving wheels, until the vehicle of the future may claim relationship more with the centipede than the horse

THE SUBSIDY SCHEME

It may not be out of place here to touch briefly on the tangible means by which the Government encourages the use by commercial firms of mechanical vehicles suitable for the requirements of the Army in a time of national emergency Prior to 1914 the stereotyped 3 ton solid tyred vehicle of a certain design, and still common on the roads of Great Britain, was known as the War Office subsidy model Owing to the factors already touched upon, when the War Office subsidy scheme came to be re introduced in 1923, the design of vehicle was changed, but the terms of the subsidy remained substantially the same

Any vehicle constructed to a specification devised by the War Department by an approved firm holding the subsidy certificate, and operated in this country, or Northern Ireland, is eligible for a grant from the War Department of £40 annually for three years, subject to a satisfactory half yearly inspection report as to its maintenance and condition. In return these vehicles are liable to be taken over at a value based on a certain agreed rate of depreciation by the military authorities after a declaration of

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national emergency and on the calling up of the Army Reserve The number of vehicles so enrolled totals 1 000 and the policy now adopted is to give preference to six wheeled vehicles of the type known as the War Department medium rigid frame six wheeled lorry the specification for which has recently been issued and is well known to all concerned This vehicle can carry a 3 ton or in some cases a larger useful load on good roads and the Army proposes to adopt a 2 ton load on bad roads or heavy going

In addition the Ministry of Transport has conceded to the six wheeled vehicle of the rigid frame type a gross laden weight of 19 tons as against 12 tons for the four wheeler and allows an individual laden axle weight of 7½ tons which admits of a considerable increase in useful load capacity over the four wheeler

It is to be hoped that perhaps the Ministry may also see its way to grant further concessions to the six wheeler in the matter of the speed limit for heavy vehicles seeing that one of the principal features of the six wheeled design is its adaptability to the employment of pneumatic tyres of reasonable proportions due to the low intensity of ground pressure

Practical Tests of Six Wheelers

Having traced the cross country six wheeled vehicle from its inception and outlined the means by which the Government endeavours to encourage its use it will not be out of place to touch briefly on some of its successes The bulk of these vehicles in the possession of the British Army are at present at home but it has been found possible to send a certain number abroad for work under particular conditions which cannot be obtained in this country

About a year ago a certain number were shipped to Egypt where after successful trials over different natures of desert terrain around Cairo they were first employed seriously in the manœuvres of the spring of this year It is not overstating the case to say that but for the presence of these six wheeled light lorries the transport service would have come dangerously near to a breakdown Owing to the desert tracks becoming cut up by the movement of troops and horsed wagons the regimental transport was incapable of moving its normal load and the few light six wheeled lorries available had to come to the rescue doing double and even treble journeys over ground impossible for any other wheeled mechanical vehicle

During the actual operations carried out in the desert bordering the cultivated area six wheelers alone were employed for the detail issue of rations the four wheelers operating on the made road between the Base and Advanced Supply Depot whilst a few six wheelers were attached to the headquarters of Formations and followed the actual course of operations Except for these latter vehicles it is interesting to know that the use of the overall chain or track was not found necessary even for actual desert work

When the expedition of a fo
the beginning of this year the
of six wheeled vehicles being sen
were found necessary in the spring the accompanying transport was composed almost exclusively of such vehicles Although happily this Force has not been required to perform anything but garrison duties opportunity has been found to try out the vehicles under what are perhaps the most difficult conditions to be found prevailing in China—the wet paddy field The performance far exceeded the expectations of those with knowledge of local conditions who did not believe it within the capabilities of any form of mechanical transport Trials over other natures of terrain—including tidal foreshore—following a railway track and the ascent and descent of a flight of 88 stone steps—were amongst the other experiments successfully carried out

Six Wheelers in India

As the needs and experiences of India are the subject of a paper by an officer of the Q M G branch of the Army in India it is unnecessary here to do more than mention that the six wheelers tried out have shown sufficient promise to warrant fairly large orders being placed for further vehicles of the type whilst trials are to be undertaken this cold weather to ascertain whether the light 30 cwt six wheeler is capable of dealing with loads of a certain type for which it was never designed namely towing field guns We have yet to learn whether it can do this under Indian conditions of terrain and climate

Now that the capabilities of these cross country vehicles are becoming more widely known requests are frequently being received from G
abroad for the
by the six wheele
as far as the resources of the Army allow and it is hoped that the knowledge gained under local conditions will be passed on to the civil authorities and potential owners and so benefit our overseas trade and assist indirectly in the development of the younger countries

In the Sudan the Government have for the past year employed successfully the medium six wheeled vehicle in conjunction with a two wheeled trailer the total useful load being 3 tons and so satisfied are they with the economical results that repeat orders for similar vehicles have been placed this year

This subject has been dealt with mainly from the military point of view as is perhaps expected of a soldier The activities of commercial firms and private owners will no doubt be touched upon in other contributions under this heading as also the purely technical aspect of the respective designs of vehicle Six wheeled vehicles in civilian hands have been operated successfully in regions one might almost say as opposite as are the Pol
to the Equator It is quite accurate to state that sat

tests have actually been carried out in the Scandinavian snows and in the bush of West Africa with vehicles of identical design It is, however only right to add that the development here outlined could not have been possible without the collaboration of the manufacturers and the closest co operation between them as a body and the department of the Army concerned Both equally played their part in the inception of the cross country vehicle and are equally looking forward to its further development It is perhaps only right to say that the greater share of credit is due to the manufacturers in as much as for them the production of the six wheeled vehicle was a leap in the dark whilst the military authorities were urged forward by the hard necessity of facing facts To the soldier it was clear that something better than the existing four wheeled light lorry was essential to the needs of a modern army and in pressing for its development there was nothing to lose and everything to gain For the manufacturers the conservatism of the owner and its effect on sales and production would seem to point in the opposite direction to them therefore is the greater honour for being far sighted enough to undertake the conversion of public opinion in the interests of the country at large and the need of overseas development

In conclusion it only remains to express the hope that this far sightedness may be justified and to say that there is every indication that it will be Already we have six wheeled vehicles enrolled in the War Office subsidy scheme in this country whilst from British colonies and countries overseas whose development is still in the earlier stages come reports almost daily of the good work done by the pioneer vehicles sent out by enterprising firms from home or imported by clear sighted administrators showing what a vast field still remains to be tapped by the commercial manufacturer with a good vehicle of the right type to offer

In this connection it is advisable to add a note of warning Even if a firm can offer the best and most satisfactory vehicle in the world for work on unmade tracks or where no track at all exists and at the most attractive price it will avail but little if a satisfactory maintenance service with adequate stocks of spare parts does not also exist near at hand to the work against the inevitable accidental breakdown Herein perhaps lies the secret of the virtual monopoly hitherto enjoyed overseas by the products of a friendly nation

Reference to the track machine has purposely been omitted as its development so far has been confined mainly to vehicles for special purposes such as purely fighting and agricultural machines It may be that the lines of development of the wheel and track vehicles will lie along converging courses and that in the cross country vehicle of the future the advantageous features of both types will be combined

The Development of Motor Vehicles Suitable for Service on Bad Roads and for Cross-Country Use.

Prepared and Submitted by Sir JOHN E THORNYCROFT
K B E M Inst C E

One of the Delegates representing the Institution of Automobile Engineers

During the last two years a new development has taken place in the transport of goods and passengers by motor vehicles in places where roads hardly exist in the ordinary sense of the term and even across desert routes where wheeled vehicles have not been used

With the introduction of the Kegresse track the French showed it was possible to run vehicles of considerable weight across the desert in Northern Africa and these first demonstrations were quickly followed by 6-wheeled vehicles built by another French firm which were shown to be capable of doing the same thing better

Colonel Niblett and the technical advisers at the War Office quickly appreciated the merits of the so called rigid type of 6 wheeled vehicle for military purposes and the impetus which the War Office gave to the construction of the type in this country by establishing the subsidy for vehicles to comply with their requirements has resulted in their being sent to many places abroad where the 4 wheeled type was not capable of performing really useful service

As a result of the first successful demonstrations which were given many regular services have been established and in countries like Australia that are as yet only partially developed and have not elaborate railway systems it has been appreciated by the Prime Minister and authorities generally that the new type of vehicle will be most valuable in acting as feeders to the existing railways and opening up the back blocks of territory

There were, of course, a considerable number of passenger vehicles of the so called Rigid 6 wheeled type at work in America before the developments I have referred to took place but they had been designed for service on the roads where the ordinary type of omnibus or passenger vehicle was running, largely to meet the taste of the American public, which believes that a coach on rails must necessarily be supported on a bogie and, *therefore, the same thing should apply to a vehicle on the road,* and they had not been adopted because the roads were too bad for vehicles of the ordinary type The arrangement of the bogie and springs, therefore, was not designed to meet the severe conditions of cross country work

The subsidy type of vehicle has been designed, not only to give much greater range of motion to the bogie and axles, but has also been designed to give a much greater tractive effort per ton



GOING ON TO A FERRY IN BRAZIL

of vehicle to enable it to travel over soft ground or up very steep gradients

The way in which larg ... tyres have been adopted on vehicles generally has, n
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For travelling over s
twin tyres and patented
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way, which has proved effective, and vehicles are now built equipped with a metal track which can be used most successfully on a single tyred wheel on each axle

While the large bearing surface which is obtained by the employment of twin tyres on one wheel has certain advantages,

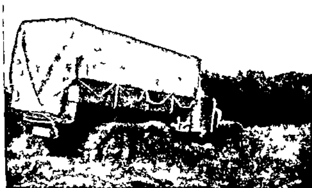


REPLACING CAMEL TRANSPORT

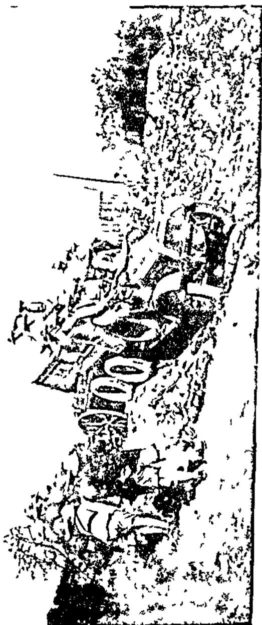
a single tyre is preferable in many ways and now that it has been shown that a metal track can be satisfactorily used with it there is I think, little doubt that single tyres will be more generally adopted than twins

It has been stated that vehicles intended for cross country work are necessarily of a different design to the 6 wheelers which had been built to run on ordinary roads, and it may be well to go into the differences in some detail

I believe the first 6 wheel vehicle to appear in any public trials was entered at Liverpool in 1898, the reason for the adoption of six wheels then being that it was felt the load demanded was too much to put on one axle At the time users did not like the idea of a 6 wheeled vehicle, as it was thought it would be much more difficult to manœuvre but before the introduction



A SINGLE CHAIN TRACK VEHICLE IN USE IN SOFT MUD



Mechanised army transport in India

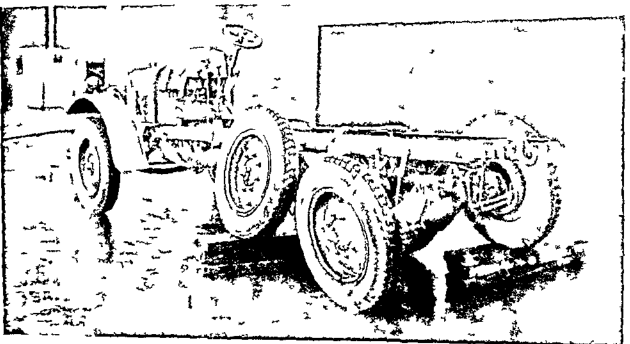
of the rigid 6 wheeler, there were, of course, quite a large number of the articulated type in regular service and the manœuvring really presented no serious difficulty The designers of the first rigid 6 wheelers, for whatever purpose they adopted the type, assumed that it would be advantageous to have a differential gear on the drive between the two axles and numerous designs were made and patents taken out for different ways of introducing it For 6 wheelers for soft ground conditions, the use of this gear between the axles is not only of no advantage but is in fact a positive disadvantage, inasmuch that if one wheel is not gripping, it prevents the other three wheels on the bogie from obtaining any driving grip Except in some cases where an independent drive was taken to each axle from the power unit, the torque reaction due to the drive tended to vary the load on the two driving axles, but this was of no great importance as long as the torque weight ratio was not a high one and the vehicle intended for use on ordinary roads With the adoption of supplementary low gears giving high torque weight ratios on the cross country vehicles it necessarily became quite important as a considerable variation in the load on the wheels of the leading and after of the two driving axles prevented the full possible advantage of the drive from the four wheels being obtained and Colonel Niblett insisted on the necessity of taking the torque reaction in such a way that it would not affect the load distribution

The method generally adopted for taking the torque in the American and French 6 wheeled vehicles was to couple the two axles together by some member along the centre line of the vehicle which would prevent them rotating about their own transverse axis on the vehicle but left them free to do so about a longitudinal one the axles being supported by a spring or springs which are pivoted at the centre and attached to the axles at the ends The method adopted by the War Office is to hold the axles in their relative positions by the ends of the supporting springs which have one central pivot and take the torque due to the drive by means of links connected to some point on the axle casing above the centre line so that the link and the springs act as a couple to prevent its rotation These links must be fitted with some form of joint having three degrees of freedom and, therefore a ball joint is adopted While this arrangement has proved to work quite well, in my opinion a better arrangement is to employ two independently pivoted springs themselves to take the torque If this is adopted, not only are the pressures on the pins due to the torque very considerably reduced, but what is equivalent to a spring drive also results a most important feature where the full effort of the engine is brought to work

roads

-els of

something approaching 2 ft Without special arrangements the springs would be seriously twisted, the method for avoi



A TYPICAL 6-WHEELED CHASSIS

this in the W D arrangement consists in attaching the spring to the axle by means of a ball and socket joint which must have also lateral freedom and in some cases by a gimbal arrangement One method permits the fitting of pin joints in contra distinction to the War Office method using ball joints

TRACTIVE EFFORT ON SOFT SAND AND BOGGY COUNTRY

Having now described the differences between the vehicles for good roads and cross country work I will give some figures of the tractive efforts per ton of load required for vehicles to traverse soft sand or negotiate boggy country and at the same time the gradients that they can climb with and without tracks

The heaviest tractive resistance which has been measured as far as I know in this country is the tractive resistance which is obtained on the loose sand in the War Department s experimental ground in the Long Valley This amounts to 450 lbs per ton equivalent to ascending a grade of 1 in 5 5 on a hard road but it seems from the reports that have been received from abroad with the loose desert sand that has been acted upon by the wind for immense periods of time such as is found in Egypt and the Sudan the resistance is very much greater Taking say 5¾ tons as the normal gross load of the War Office subsidy type 6 wheeler the tractive effort required to overcome the resistance of sandy surfaces such as that at Aldershot would amount to only 2 600 lbs whereas the tractive effort available according to the power curve which is shown amounts to 7 000 lbs that is to say over 2½ times as much

We know of instances where the motor has been stalled when the vehicle has been travelling over desert sand so it would appear that under certain circumstances the tractive resistance can be as high as half a ton per ton when wheels alone without tracks or bands are being used

The curve which has already been referred to shows the tractive effort of the various gears which are available in the Thornycroft A3 type fitted with a back axle ratio of 8¾ to 1 It gives a very good idea of the way in which the gear ratios are distributed and shows very clearly the use that can be made of the auxiliary gear box and that with the bottom gear the tractive effort which is available should be sufficient to take a full load up an incline of 1 in 2 and on a level hard road loaded as above described experiment has shown that with this effort on the driving wheels acting through the adhesion of unworn tyres it was possible to start and pull a load of 81 tons composed of loaded lorries This works out at 18 times the adhesive weight on the driving axles

There are of course many cases in which 6 wheeled vehicles can be employed with great advantage to travel over uneven ground or badly made roads where these very high tractive efforts are not required and the auxiliary gear box is unnecessary

It often happens in undeveloped countries that the bridges

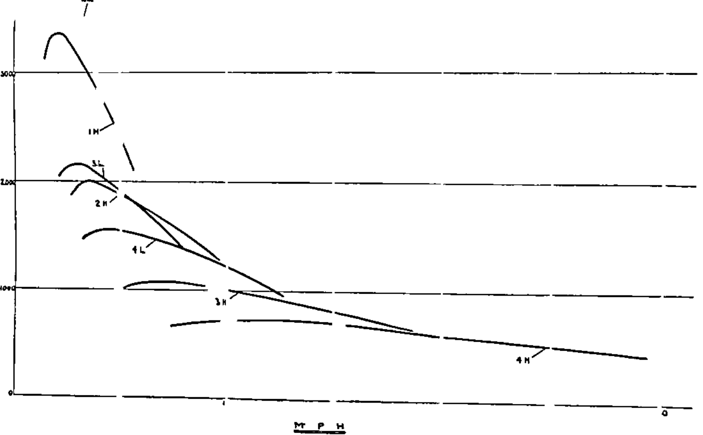
TRACTIVE EFFORT CURVES

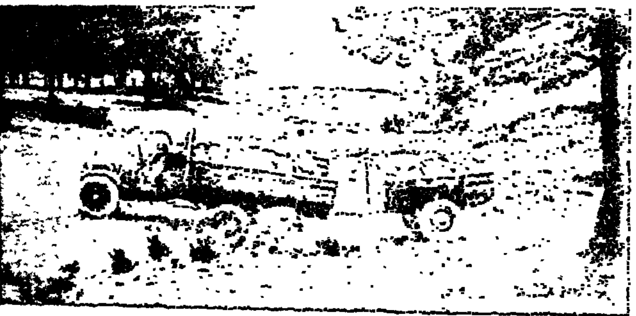
THE eight curves show the available tractive effort upon each gear calculated from the brake mean effective pressure of a standard engine

The left hand end of each curve corresponds to 600 r p m of the engine and the other end corresponds to 2,400 r p m

The curvature indicated is due to the brake mean pressure, which rises from 600 r p m to about 1 000 r p m and then falls gradually with increase of speed

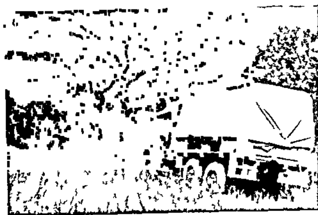
The curves show the distribution of tractive effort available in each gear and indicate where they approach each other the approximate speeds in m p h at which


3000
2000
1000
0
1 H
3 L
2 H
4 L
3 H
4 H
1
0
M P H



SUBSIDY SIX WHEELER WITH TRAILER

and culverts that are available are not suitable for heavy axle loads, and the 6 wheeler, of course has a great advantage over the 4 wheeled type owing to the reduced load on any pair of wheels It not infrequently happens that bridges are unsafe for even a 6 wheeler, and it is necessary to go through fords, it is essential, therefore, that the sensitive parts of the motor are arranged so that they will not be interfered with when the vehicle is running through 1½ ft or 2 ft of water It has been suggested that vehicles intended to travel over very bad ground should be arranged with forward control so that the driver would get a better opportunity of seeing the track immediately in front of the vehicle The result of experience with several hundred vehicles in different parts of the world goes to show that the ordinary driving position is quite satisfactory Vehicles running long distances away from bases or repair depots should be built so as to give the best possible access to the motor and working parts While quite a good arrangement of forward control can be made,

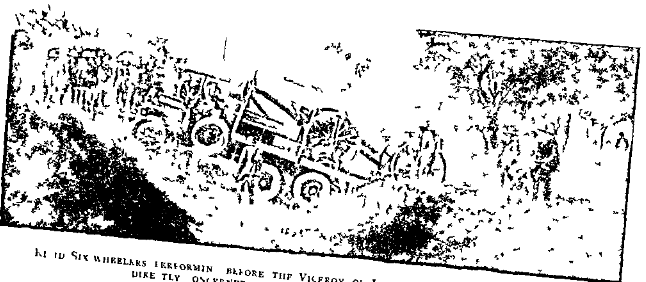


A ROAD IN KENYA

it is generally accepted that the motor of a forward controlled vehicle cannot be as accessible as when the driver is in the normal position behind it

In undeveloped countries petrol is often dear, and users of vehicles think they will reduce their costs by employing some alternative fuel Charcoal used in a gas producer is often proposed and in some cases alcohol It has been shown that successful results can be obtained with both these fuels but, with the gas producer while good results may be obtained in skilled hands, it has not yet been shown to give reliable working in the hands of the average driver

The service which the 6 wheeled vehicle is usually expected to perform in undeveloped countries is of such a strenuous character

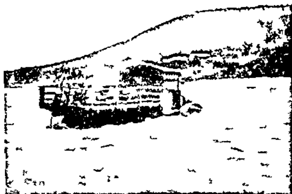


Kt id Six wheelers performin before the Viceroy of India and Leading staff officers dire tly oncerned with mechanised transport in India

that the motor must be given the best possible chance and owners will be well advised to use the best petrol that is available

Having referred in general terms to the recent developments of the rigid 6 wheel vehicle I will refer to a number of instances of its successful employment I think the South African Railway Administration were the first to realise the possibilities and after a time quickly organised a number of different services acting as feeders to different parts of the railway system both for passengers and goods and also mails The Sudan Government about the same time established regular transport services and now have several for cotton and other produce

The motor service which has been working from Syria to Bagdad is fairly well known While the road across the desert is such that it is possible at certain times of the year for it to be traversed by high powered motor cars there have now been put



CROSSING THE TUGELA RIVER

into service a number of large specially designed rigid 6 wheelers Early this year subsidy type 6 wheelers were tried across the same route by Lord Montagu who reported that the subsidy type 6 wheeler which he drove taking a heavy load made as good a speed as the high powered cars which were accompanied and made the journey on just about the same petrol consumption Since then a number of these vehicles have been in service conveying pilgrims and other passengers from Bagdad to the Palestine coast

In Brazil 6 wheelers have opened up country in which only the lightest type of car had previously been and are even used for carrying logs of valuable timber long distances through the forest tracks In Argentina on the very soft sandy roads they have shown their great advantages In Borneo they have been used to carry material for pipe lines to the interior for the oil companies In Australia they are being used for the carriage of wool and

timber In addition some of the Oil Comp[illegible] em
to carry their petrol [illegible] the
main roads [illegible] steep
for long distan[illegible]

A point which must not be lost sight of is that the 6 wheeler is really a first class vehicle on ordinary good roads The additional axle, of course, adds something to the complication and cost but, unlike cross country vehicles of the track type they are at no disadvantage when travelling on good hard roads and it may be even claimed that they possess advantages over the ordinary 4 wheeled type

Road Construction and Improvement in relation to the Development, Efficiency and Economy of Road Transport in India.

Prepared by the General Staff Branch of the Army Department Government of India
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In India the whole question of transportation is attended with special difficulties The distances to be traversed are enormous, the natural obstacles to be overcome in passing from one region to another are formidable while even within a restricted area, internal communications often break down altogether in the rainy season It is no uncommon occurrence in India for trunk roads and railways to be cut by floods and for important market towns to find themselves entirely isolated from the neighbouring districts

The communication difficulty is an old story in India Throughout her history it has exercised a preponderating influence upon her political as well as upon her industrial condition Even such modern expedients as railways telegraphs and motor transport have failed so far to provide a complete solution If commercial development is to proceed along the lines which the interests of the country demand unceasing efforts combined with great expenditure must be devoted to the task of improving the road and railway communications of the country

Need for Extension of Roads

The necessity for extending India s roads is every day more apparent The economic loss caused by the inaccessibility of agricultural districts in the rainy season must be considerable, and this cannot be remedied until the system of trunk roads is more adequately developed Some progress it is true, is being made every year but the rate falls far below the true requirements of the country The total mileage of metalled and unmetalled roads maintained by public authority is still only about 216 000 Until this figure can be largely increased it will be impossible fully to utilise the more speedy means of road travel which modern progress now demands

Unfortunately little public interest is aroused by this question, and there are ominous signs that the general condition of all but

the main arteries such as the trunk roads is suffering deterioration Of late however there has arisen an encouraging development which may eventually save the situation In the districts surrounding many large towns light motor lorries are coming into high favour with those villages which lie upon practicable roads The establishment of omnibus services by private enterprise for rapid communication between outlying hamlets and the nearest market centre has already proved commercially possible Better still it is certain before long to lead to a demand for good roads on the part of those with power to enforce their views

It is interesting to note that whereas in 1872 the total railway mileage amounted only to 5 369 by the end of the year 1924 25 the figure was approximately 38 000 miles England so small by comparison both in population and in area has 50 000 miles and the United States of America a quarter of a million miles

Thus both as regards railways and roads India is undeveloped The quality of the metalled roads which exist in India is generally speaking good In the plains the Grand Trunk routes radiating from Delhi to Bombay Calcutta Peshawar connecting Bombay and Madras and joining up other important cities provide many miles of wide straight level and well surfaced though dusty roads In the hill districts of the North West Frontier in the passes of the Himalayas and the Western Ghats a high standard of engineering has been observed in the grading cornering banking and surfacing of metalled roads

The inadequacy of the metalled road system in India is compensated to some extent by the possibility of the unmetalled roads and bullock and camel tracks for certain classes of motor traffic in the dry seasons A vast mileage of bullock and camel tracks interconnect the innumerable villages in the outlying agricultural districts over which the six wheeled vehicle can be operated in particular economically for nine months of the year

Motor Transport Development

Although little progress has been made in recent years in the development of the road mileage of India it is interesting to note that this does not seem to have affected the increase in the numbers of motor vehicles imported

In 1921 [illegible] 89 vehicles of all types were imported into India In 1926 the figure reached 19 380 and the rate of increase appears to be rising

Motor Transport as an Instrument of Development of India's Resources

Three quarters of the 320 000 000 population of India gains its livelihood in agriculture Cotton manufacture ranks first in the industries, engaging nearly 8 000 000 whilst trade occupies 18 000 000

In connection with agriculture the use of the motor vehicle is likely to remain limited This is accounted for by three factors —

1 Agriculture is the pursuit of the small holder who cannot afford the capital outlay of mechanical vehicles 2 A large proportion of the produce is absorbed locally in the villages situated in the agricultural areas and the labourer generally receives payment for his labour in produce 3 The balance available for export and consequently for transport is conveyed to the railway by bullock transport thus occupying the animal which at other seasons is yoked to the plough fed off the land and utilised for its food and hide bearing qualities

Trade and the leading industries employ a certain amount of mechanical transport but it is difficult to anticipate any great increase in these in view of the slow development of trade and industry the imperceptible improvement in the standard of living of the people and their oriental contentment with things as they are and as they have been for generations

The Necessity for Co operation Between Road and Rail Transport

The native of India is a great traveller the third class passenger on the railways accounting for a large proportion of the receipts Thus passenger traffic accounted for an earning in 1926 of Rs 449 060 000 whilst goods traffic accounted for Rs 668 264 000 Apart from his readiness to make use of railway facilities for travel the Indian has shown a distinct readiness to make use of the increasing adoption of passenger motor vehicles Unfortunately the inexpensive A
vehicle is being employed
instead of as feeders to th
three causes —

1 The ability of the motor vehicle to convey the passenger from door to door

2 The congested and uncomfortable third class passenger accommodation on the trains and in the railway stations

3 The exaction of largesse by and the petty officialdom of the railway subordinates responsible for dealing with the third class passenger

There appears to be great scope for the development in India of the already existent third class passenger carrying motor vehicle services as feeders between outlying towns and villages and the railway stations and in this connection the six wheeled vehicle would appear to offer great advantages through its ability to carry a much larger number of passengers for its weight horse power and cost than the four wheeler and to negotiate more easily the level but unmetalled roads and tracks which connect the villages with the railways

Scope for the institution of first class passenger carrying motor services also appears to exist in connection with circular tours n

districts of historical or other interest adjacent to the railways and for opening up the large areas which exist between the meshes of the railway system Such first class passenger services might very well be modelled on the services operated in North Africa by the Compagnie Generale Transatlantique, which provide a net work of itineraries through country less suitable than India for the economical operation of passenger carrying vehicles

High speed long distance first class services might also be profitable if run on similar lines to those in the United States of America and in Iraq by the Nairn Transport Company

In this connection India possesses the important advantage that all the main and secondary roads, and many of the most outlying places are well provided with hotel accommodation in the form of Dak bungalows at which first class travellers may stay On all main and secondary routes these bungalows are to be found approximately every 20 miles and although of small capacity they are invariably clean, well maintained, and could no doubt be increased in size in accordance with the requirements of the traffic

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growing third class passenger road traffic could be successfully prosecuted and would appear to be a lucrative business for the *railway companies, or properly established transport companies* working in conjunction with them

The Development of Motor Vehicles Suitable for Service on Bad Roads and for Cross country Uses

The introduction of the six wheeled vehicle into India was effected by the Army in October, 1926 Two light six wheelers of War Office pattern arrived in that month and after initial trials in the neighbourhood of Bombay proceeded by road to Delhi via the Western Ghats and Ahmednagar, a total distance of over 1 000 miles a distance which was accomplished without prepara tion in nine days At Delhi these vehicles costing less than

vehicles *Since then they have undergone* cross country and intensive reliability trials in conjunction with other War Office pattern medium six wheelers of larger capacity and an extensive mileage has been covered with complete success under the varying Indian conditions of climate and terrain

Indian Tests of Six Wheel Vehicles

In July a light and medium six wheeler journeyed from Quetta to Karachi and back a distance, each way of 176 miles of which no less than 370 consisted of the roughest camel *track*

The outward journey was accomplished in three days, with shade temperatures varying from 70 to 110 degrees F The return journey occupied four days, making a daily average over the whole journey of over 100 miles Beyond the fracture of a clutch operating rod which was quickly repaired, and five punctures no trouble was experienced, although the vehicles had been subjected beforehand to some very severe cross country trials in connection with artillery haulage

At about the same time, another medium six wheeler was converted from its load carrying role to that of an armoured car, which duty it performed with complete satisfaction for 500 miles, including arduous tests in the Frontier nullahs and over cross country routes in the plains

The reliability, usefulness and versatility of the six wheeler having been established, the Army in India has placed orders

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dium artillery

tractor (experimental)

In view of the successful development of the six wheeler by the Army in India, and the economy which is being effected by its use, there seems little doubt that similar success would follow its civil application on the lines already described particularly as the Army is anxious to effect a considerable saving on its annual charges for mechanical vehicles by instituting a subsidy scheme, by which the civil user would be encouraged to employ a type of six wheeler suitable both for military and commercial requirements

The Improvement of Facilities for International Road Travel

Boundaried on two sides by sea and on the third by deep belts of mountainous country, India presents few attractions to the international traveller by road

A small amount of traffic of this description takes place between Afghanistan and India via the Khyber Pass and plans are in course of preparation by private enterprise for the prospecting of a route through Baluchistan to Persia by means of a light six-wheeler It is unlikely, however, that any considerable development of such *International traffic will take place*

Fuels and Fuel Supplies for Road Motor Vehicles

Petroleum is found in India in two distinct areas—one on the East, which includes Assam, Burma, and the islands off the Arakan coast This belt extends to the productive oil fields of Sumatra, Java and Borneo The other area is on the West, and includes the Punjab and Baluchistan, the same belt of oil bearing rocks being continued beyond the borders of India to Persia

Of these two, the Eastern Area is by far the more important. A decline of output is taking place in the Attock district of the Punjab due to exhaustion of the old wells occurring more rapidly than the supplies added by new wells. The total output of petroleum in India and Burma is rather less than 300,000,000 gallons annually, and while this remains fairly steady, imports of mineral oils are increasing and in 1926 reached 187,000,000 gallons, of which a considerable proportion came from Persia.

Very little petrol is imported from abroad, the bulk of the spirit employed in India coming coastwise from Burma, consequently the wholesale prices ruling are high, varying from 17½ annas (19 7d.) to 29½ annas (33 2d.) per gallon in different parts of the country and appear to be determined by supply and demand tempered by consideration of the probable cost to foreign oil companies of competing in the relatively small Indian market. Home-produced petrol is liable to an excise duty of 4 annas (4 5d.) per gallon, and imported petrol to an import duty of a similar amount. It is unlikely that success would follow an effort to develop alternative fuels such as benzol, alcohol or producer gas.

Benzol and alcohol could no doubt be produced, but it seems doubtful whether they could compete satisfactorily in a petrol-producing country.

Producer gas if generated from [illegible] a practical proposition in the dry [illegible] everywhere in India, but it might [illegible] occur during the Monsoon when humidity is very high and not infrequently reaches saturation. Moreover, every square foot of body capacity is required on the passenger-carrying vehicle in India, which, as explained above, is the most likely type to develop extensively, and the bulky nature of the generating apparatus and of the fuel is likely seriously to hinder the use of charcoal producer gas.

Still less readily could it be adopted by the Army in India, which already requires a larger body capacity on its supplies lorries than is required by the Army at Home, owing to the bulkier nature of the loads to be carried.

The Six-Wheel Motor 'Bus and its Advantages from the point of view of Suspension.

By L BACQUEYRISSE

Directeur General de l Exploitation et des Services Techniques de la Societe des Transports en Commun de la Region Parisienne and submitted by him on behalf of L Union des Voies Ferrees et des Transports Automobiles de France (French Union of Railways and Motor Transport)

The Société des Transports en Commun de la Région Parisienne (S T C R P) has carried out experiments with two types of six

passengers and

on lines which

which was built

by the Renault Co can carry 25 passengers The S T C R P had the opportunity of examining the latter type as a Member of the Jury at the Suspension and Shock Absorber Competition organised by the City of Paris in the Spring of the present year

THE S T C R P 6 WHEEL MOTOR BUS

The following are the main particulars of this vehicle —

			Approx
Front wheelbase		4m 352 (14 ft $3\frac{1}{4}$ in)	
Rear wheelbase		2m 150 (7 ft)	
Weight empty	(Front axle)	2 280 kgs	(2 tons 4 cwts 3 qr)
	(Middle axle)	3 420 ,	(3 tons 7 cwts 1 qr)
	(Rear axle)	1 640 ,	(1 ton 12 cwt)
		7 340 ,,	(7 tons 4 cwts)
Weight loaded	(Front axle)	2 430	(2 tons 7 cwts 1 qr)
	(Middle axle)	5 520	(5 tons 8 cwts 3 qr)
	(Rear axle)	2 450	(2 tons 8 cwts 1 qr)
		10 400 ,	(10 tons 4 cwts 1 qr)

Single 960 × 160 × 105 mm solid tyres are fitted on the front and rear pairs of wheels and twin solid tyres of the same size on the middle wheels The front and rear axles are steering axles The movement of the steering gear is transmitted to the front wheels by a ball headed connecting rod and to the rear wheels by connecting rods and levers

The middle axle is the driving axle The suspension of each of the three axles consists of two semi elliptical springs The two front springs are independent The middle and rear springs of each side are connected by a lever oscillating about a pin fixed to the chassis The result is that the loads on the wheels are independent of the profile of the roadway and that the load on the middle axle and that on the rear axle are in a constant ratio determined by the ratio of the arms of the lever The loads on the two steering axles can be made approximately equal by a suitable choice of this ratio, which is advantageous from the point of view of ease in steering, absence of skidding and adherence of the middle axle

This arrangement has very clear advantages from the point of view of suspension The movements of the two middle and rear suspensions although connected to one another are independent and asynchronous owing to the fact that they are neither called into action at the same time nor in the same place This enables them to assist one another it being possible to consider each of them as an elastic shock absorber for the other Reactions on the ground on the one hand and on the chassis on the other are thus reduced Proof of these qualities was obtained by comparative tests carried out on a 6 wheel motor bus and on a 4 wheel bus the particulars of the latter being as follow

		Approx
Wheelbase	4m 352 (14 ft 3¼ in)	
Weight empty (Front axle)	2 160 kgs	(2 tons 2 cwt 2 qr)
(Rear axle)	3 040	(2 tons 19 cwt 3 qr)
	5 200	(5 tons 2 cwt 1 qr)
Weight loaded (Front axle)	2 370 kgs	(2 tons 6 cwt 2 qr)
(Rear axle)	5 440	(5 tons 7 cwt)
	7 810	(7 tons 13 cwt 2 qr)

Single 960 × 160 × 105 mm solid tyres are fitted to the front wheels and twin solid tyres of the same type to the rear wheels The tests consisted in the measurement of dynamic action on the ground and of accelerations in the interior of the vehicles

Dynamic Action on the Ground

The wheel to be tested is run at various speeds over an obstacle of determined shape placed on a dynamometric pedal which indents a test piece of copper or mild steel taken from a number of test pieces of the same metal by means of a very hard steel sphere The law of the variation of the diameters of indentations as a function of the pressure brought to bear on the sphere is previously determined in the press with a similar number of test pieces which enables the coefficient of pressure due to dynamic action to be calculated for each test viz

$$\frac{P - p}{P}$$

where P is the dynamic load and p the static load

The following average results were obtained during the tests carried out —

Average Coefficients of Pressure Due to Dynamic Action

Tests	On rear axle of 4 wheel bus	On middle axle of 6-wheel bus	Advantage in favour of 6 wheels
Empty	1 64	1 36	17 1%
Loaded	1 03	0 89	13 7%

Acceleration

Comparative tests were carried out with the help of a liquid accelerograph designed by the S T C R P having a period of its own of 1/200th of a second this being fixed to the right of the

driving axle on the floor of each bus the buses were run over an obstacle of determined shape at various speeds the speed in each test being the same for both vehicles The test speeds were 8 and 20 km per hour (5 and 12½ m p h)

Comparison of the accelerations obtained on fully loaded vehicles did not reveal any very notable difference between the two types of buses It is a well known fact moreover that vibrations loaded or empty per cent in favour on empty vehicles per cent

These 6 wheel motor buses have been in service for six years and have given entire satisfaction both as regards consumption the cost of maintenance and as regards the comfort of the passengers, this type of vehicle can carry 48 passengers while the 4 wheel buses only carry 38

THE RENAULT 25 PASSENGER 6 WHEEL MOTOR BUS

The design of the Renault 6 wheel chassis which is capable of carrying a paying load of 3½ tons and on which a 25 seater bus body has been fitted differs from the 48 seater 6 wheel S T C R P bus by the presence of two driving axles Each of these is connected on each side to the chassis by a cantilever spring The two springs on the same side are hinged at their centre on the chassis and their ends rest on the two axles

Therefore in addition to the participation of the two suspensions in absorbing the reactions received by one of the two axles there is a reduction in the unsuspended dead weight of each which represents a further cause of improvement in the suspension

This bus is mounted on 1 000 × 190 mm balloon pneumatic tyres inflated to a pressure of 2 875 kilog per sq centimetre

During the Suspension and Shock Absorber Competition organised by the City of Paris it was found that this vehicle

improvement of 33 per cent as regards acceleration measured in the interior of the vehicle

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Modern Processes for Utilizing Gases in Engines. Coal Gas as an Alternative to Motor Spirit.

By L BACQUEYRISSE

Directeur General de l Exploitation et des Services Techniques de la Societe des Transport en Commun de la Region Parisienne

Recent research work in France on cheap home produced fuels has included tests on the utilisation of various gases as fuels for the engines of motor vehicles

These gaseous fuels can be classified into two categories corresponding to the methods by which they are produced viz

(1) GASES PRODUCED ON THE VEHICLES THEMSELVES (ACETYLENE PRODUCER GAS ETC)

Acetylene produced from carbide in a generator must be carefully freed from various impurities (lime phosphoretted and sulphuretted hydrogen and ammonia) Acetylene is an endothermic compound having a calorific value of 11 500 calories per cubic metre relatively low ratios of volumetric compression (3 5 to 4) are necessary if it is desired to obtain satisfactory running without detonation or pre ignition The thermodynamic efficiency of engines using this fuel is therefore low and it has not yet been possible to bring this gas into general use for this purpose

Producer gas is formed by the combustion of wood charcoal or wood in portable producers and consists of a mixture of carbon monoxide and hydrogen which is rendered more or less complex in the case of wood by the presence of various products of distillation Its calorific value varies from 700 to 800 calories per cubic metre for producer gas from wood to 1 000 calories for air gas and 1 200 calories for mixed water gas

The dry method is now generally used for purifying the gas when it leaves the producer

The design of so called bituminous suction producers enables any tar to be eliminated by pyrogenation in the hot zone The other impurities are removed by scrubber tubes and cotton filters

Carburation is effected by means of very simple mixers frequently embodying a gas inlet connected to the accelerator pedal and an air inlet adjusted by hand

The low calorific value of the mixture leads to a diminution of power varying between 25 and 30 per cent for wood charcoal and 35 to 40 per cent for wood as compared with petrol

Attempts have been made to compensate for this loss by increasing the ratio of compression or the stroke capacity or by feeding the mixture under pressure

Producer gas plants for use on motor vehicles have now been brought to such a state of perfection that their use can be generalised

(2) GASES NOT PRODUCED ON THE VEHICLES THEMSELVES

Acetylene in the dissolved state stored under pressure is the first of this group Further progress will have to be made how ever in its technics before it can be brought into general use

On the other hand coal gas or coke oven gas methane hydrogen carbon monoxide and the residual gases from the processes of cracking low temperature distillation and the

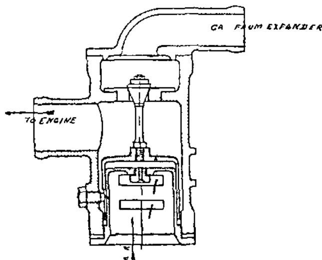


FIG 1 —SECTION OF TOWN GAS AIR MIXER

manufacture of various synthetic products are all worthy of consideration

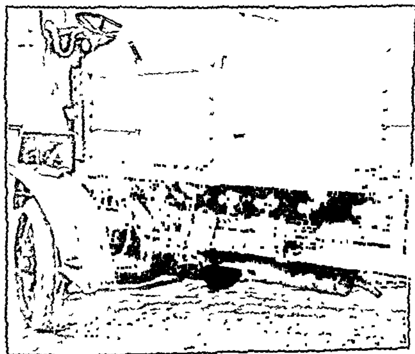
Flexible low pressure containers which have been used on different occasions—in
Omnibus de Paris in
have been abandoned
to 150 kilog per sq centimetre are now used A French firm will shortly place on the market a type of light electrolytic iron gas cylinder bound with piano wire

The gas is expanded before its admission to the carburettor

by the Société des Transports en Commun de la Région Parisienne (S T C R P), and of which a section is given in Fig 1

Coal gas, which is one of the gaseous fuels now obtainable in industrial quantities, supports relatively high ratios of compression —from 5 to 6

In its research work on cheap fuels the S T C R P has been led to study the possibility of using town gas for motor 'bus engines As an experiment a lorry (Fig 2) was equipped with a set of six steel cylinders containing town gas supplied by the *Société du Gaz de Paris* of which the pressure was increased by *stages from 25 to 150 kilogs* per sq centimetre



TO *USE* COAL *GAS* AS FUEL

Expansion takes place in a single acting diaphragm expander and carburation is ensured by the special carburettor mentioned above

The resu[illegible] regards the [illegible] developed [illegible] tuned, and [illegible]r the ordinary work of the lorry was [illegible] cubic metres of ga[illegible] having a calorific value of 4,500 calories per cubic

metre against 0 4 litre of a volatile liquid fuel containing 8,240 calories per litre The respective consumptions in calories therefore work out at 2,850 for town gas against 3,290 for the liquid fuel, the economy in calories in favour of gas being 10 per cent, this corresponding with what has previously been pointed out by various authors In our opinion, this saving can be attributed to the fact that the mixture is more homogeneous than is the case with that of liquid fuels A lorry weighing 8,000 kilogs (nearly 8 tons) was thus able to cover a distance of 65 kilometres (about 40 miles) with 6 cylinders, each containing 7 cubic metres of gas at a pressure of 150 kilogs per cubic centimetre This lorry has now run several thousand miles

Experiments in connection with the compression of the gas carried out by the Société du Gaz de Paris have shown that it is advisable to use a gas not containing more than 2 per cent by volume, of free oxygen in order to eliminate risks of explosion

Supplies of compressed gas can be made available in various ways, viz, the installation of compressor sets at one of the termini of each line, the conveyance of cylinders of gas compressed at the generating station to the loading centres the utilisation of special piping, &c, all of which should be carefully studied and compared before a choice is made

Finally, it should be mentioned that a certain number of firms in and around Paris (Citroen, Chenard Walcker Kermina, the S T C R P, &c) utilise town gas for running their engines during the bench tests effected before they are mounted in the chassis

To sum up, the utilisation of various gases and, notably, coal gas, as the fuels for motor vehicle engines is technically possible and they are likely to become serious competitors to petrol

Town gas and methane, which are produced in abundance in gas works and coke ovens appear, in particular, to be obtainable almost immediately in quantities and should, therefore, be of

which appear likely to give interesting results in the future

The Improvement of Facilities for International Travel by Road.

INTERNATIONAL TOURING

By Stenson Cooke Member of the Executive of the Alliance Internationale de Tourisme and Secretary of the Automobile Association of Great Britain

Submitted on behalf of the Alliance Internationale de Tourisme

Before it is possible to discuss the improvement that might or should be made in the facilities for international motoring it is necessary to remind ourselves what the international European situation used to be in the early days and to review the very practical benefits we already enjoy, thanks to co operative effort by those who set themselves to the task of ameliorating conditions—thanks in fact to Organised Motoring

Part I —Historical

Up to the year 1909 every motorist proceeding abroad from his own country met with great difficulties First of all Customs duty had to be deposited at the port or frontier and not infrequently vexatious delay was caused owing to dispute about the value of the vehicle The next formality was the acquisition of driving and car licences In France, for instance this involved a visit to the chief town of the Department Thus a British motorist landing at Calais had to proceed to Arras—114 kilometres (71 miles)—for a licence to obtain which entailed an examination by an Inspector of the Service des Mines and an appointment had to be made with this official involving perhaps a day s delay—or more

Similar and greater difficulties were met with regularly in other countries and the above example is quoted merely to illustrate the hindrances encountered

We ought to be very grateful to those pioneers of international travel By submitting more or less cheerfully to troubles hardships and delays they demonstrated that there was need for improvement That need had to be met A new factor had arisen in international relations

The three cardinal difficulties that hindered motor travel from one country to another were those of Customs dues, the licensing of the driver and the registration of the car

The question of Customs duty was solved by the introduction of the " triptyque This is so commonly in use to day that few ever give a thought to the ingenuity behind its conception A word about it will not be out of place at this World Congress

A triptyque is a three part pass sheet " which a Touring, or Automobile, Association or Club is permitted by the Government

of its country to issue to a motorist to frank him past the Customs barrier without the necessity of depositing duty at the place of entry The duty liability is secured by a general guarantee given to the Government by the authorised Association or Club which in turn is guaranteed by the Associations and Clubs in other countries with which it is allied A motorist who belongs to one of these organisations deposits cash and (or) security to the amount of his potential liability and so qualifies to receive a triptyque This duty liability is incurred in the event of the motorist breaking the strict conditions under which he accepts the triptyque When he enters the country one sheet of the triptyque is retained by the Customs officer, and when he leaves, the Customs detach the second sheet and endorse the remaining sheet which thus serves the motorist as evidence that his liability is cleared and enables the Association or Club to refund his deposit and release the security it has held

Triptyques were introduced in 1909 for France, Germany, Austria, Holland, Belgium Switzerland Italy and Spain Thus was the Customs difficulty surmounted, and a great impetus given to international motor travel Other countries have since joined the triptyque regime

A further simplification of Customs difficulties was the Carnet de Passages en Douanes, introduced early in 1914 This carnet allows the motorist to pass through several countries in succession, with only one (multiple) document which the various governments concerned had agreed to honour The chief advantage to the motorist, but not the only one is that he is required to give security for only one country the country on the list that has the highest duty, so that it constitutes a great financial alleviation, *compared with the separate triptyque for each country which had* hitherto been obligatory

So far as Britain was concerned it was not until after the outbreak of the War, when a Customs duty of 33 1/3 per cent was introduced, that the use of the triptyque and carnet de passages en douanes became necessary for a visit to Britain These were sanctioned in 1916

At first it was incumbent on the motorist to deposit with his Association or Club the total amount in cash of the duties for all countries he wished to visit At a later date, the Automobile Association of Great Britain originated a scheme, whereby the member was only required to make a small deposit in cash, and to give a Banker's Indemnity for the balance of the money Still later, triptyques and carnets de passages en douanes were issued against a small cash deposit by the motorist and a Customs Guarantee for the balance of the duty given by an Insurance Company, which charges only a small premium for its services

In this way, the path of the international motorist has been

their solution

The triptyque and carnet de passages en douanes have served to develop international "Tourisme" Each Club and Association in the Alliance Internationale de Tourisme possesses the carnet de passages en douanes and receives the triptyques of the other clubs and associations and so is able to supply its members with all they need for a tour traversing a number of countries The system is admirable and works smoothly It now extends to most countries of Europe and to some beyond

As with the Customs barriers even so have the difficulties in connection with drivers licences and motor registration been overcome In the same year (1909) that the triptyque service was inaugurated there was held at Paris—on October 11—an International Congress of Government representatives who signed a Convention from which emerged the International Travelling Pass This came into force in 1910 It enables a motorist originating from one of the signatory countries to circulate through any of the others on the basis of his "domestic" driving licence and vehicle registration All that is required of him is that he should obtain in addition an International Pass (Certificat International de Route) and add to his rear number plate a small plaque bearing the code letter or letters, assigned to his country

The scope of the International Travelling Pass will be better appreciated when it is realised that it is valid in the following countries against the name of each of which is given the distinctive code letter —

Alderney (G B A)
Algeria (F)
Argentine Republic (R A)
Austria (A)
Belgium (B)
Bulgaria (B G)
Czecho Slovakia (C S)
Dantzig (Free City) (D A)
Denmark (D K)
Egypt (E T)
Finland (S F)
Great Britain & Northern Ireland (G B)
Greece (G R)
Guernsey (G B G)
Hungary (H)
India (British) (B I)
India (French) (F I F)
Irish Free State (S E)
Italy (I)
Jersey (G B J)
Liechtenstein (F L)
Monaco (M C)
Morocco (French Zone) (M A)
Netherlands (N L)
Norway (N)
Poland (P L)
Portugal (P)
Roumania (R M)
Russia (R)
Sarre Basin (S A)
Spain (E)
[illegible]

the Royal Automobile Club, [illegible]
Club

[illegible] the vehicle
and the other for th[illegible]

These various concessions to the motorist were largely due to the activities of the international association entitled Ligue Internationale des Associations Touristes (L I A T), which was founded at the International Congress held at Luxembourg on August 4, 1898 The L I A T held its last Congress at London, at the invitation of the Automobile Association of Great Britain in June, 1911 Shattered by the War the L I A T was reconstituted in a different form on May 30 1919 as the " Alliance Internationale de Tourisme (A I T)

The A I T , on whose behalf I speak is a great confederacy of Touring Clubs and Associations It extends from California to Poland Constituted by clubs with an aggregate membership exceeding 2 500,000, it may be considered the most potent force to day for the development of international travel by road Its members spend vast sums annually abroad but what is of still greater value, they meet foreign peoples and sow seeds of inter national amity Since its foundation the A I T has been spreading As it spreads so the improvement of travel facilities proceeds

are its co operation with
nification of legislation, its
lication of plans maps and

national regulations Above all is its moral role It brings together the persons who direct touring in different countries, enables them to become acquainted and to learn to esteem each other, and so facilitates the international exchange of benefits and ideas

PART II —IMPROVEMENTS

Having reviewed the main accomplishments in the field of international circulation, we may turn to a consideration of what remains to be done

A great deal remains to be done and much can be accomplished now that the nations can meet—on occasions such as this—in a helpful spirit of mutual appreciation both of each other's difficulties and of the desire of all to co operate

Chief among the tasks still to be undertaken are the simplification of the triptyque, the carnet de passages en douanes and *the International Travelling Pass, and their extension to all* civilised countries throughout the world

We, the Nations of Europe, are proud of the triptyque regime which passes hundreds of thousands of motorists freely across our frontiers But may we not envy and perhaps hope to attain to the accord that exists between the United States of America and Canada? Under this, 2 000 000 American motorists—it is stated—crossed into Canada last year with little more formality than the production of their driving licences There the tourist is confronted with no question of depositing money Certain European countries do exactly the same in the case of motor and pedal cycles Does not that prove that the idea is not quite visionary? Though the difficulties in the face of

complexities of European tariffs frontiers and trade agreements are very great

As regards the International Travelling Pass Europe has an advantage over the United States of America which cannot constitutionally find a means of subscribing to it Each of the 48 States in the Union would have to pass legislation before the Federal Government could sign the United States into the Convention The present disability has reactions and Americans who desire to take their cars to Europe are inconvenienced as are tourists who wish to visit the United States

A few years ago the inclusion of the United States of America on the International Travelling Pass was of little significance but to day travel is inter continental Already the great liners are equipped with garages Cars are carried uncrated as baggage and a great motor traffic is growing up across the oceans of the world The Automobile Association of Great Britain maintains a special staff at each of the principal ports to receive the incoming motorists many of whom have made all necessary arrangements in advance for triptyques and other services

This traffic can be developed if Overseas clubs follow the lead of the American Automobile Association which has established a foreign department conversant with regulations current throughout Europe

And now we come to a consideration of the specific questions that still remain to be dealt with Let us take these in detail —

Road Signs —It is beyond controversy that from the point of view of international automobilism the world would be the better for a uniform system of cautionary and direction markers This principle has been subscribed to at several international conferences but it must be realised that with so many other post war liabilities of greater significance the adherent nations cannot yet put precept into practice except on a small scale In the mean time the progress which is being made at present must suffice

The main objective has perhaps been attained by securing general approval of the triangle to signify danger This sign which has been standard in Great Britain for nearly 25 years is often to be seen to day throughout Europe and in other parts of the world It serves to give the motorist when in a foreign country a signal which he knows means danger With this [illegible] The danger triangle [illegible] crossings are specially

[illegible] ouring and Automobile [illegible] on the roads and it is only fitting to take this opportunity of declaring the fact Generally they are acting in conformity with approved ideals, promulgated through the medium of the A I T

Traffic Signals —As with road signs, so with traffic signals an endeavour is being made to secure uniformity The question was discussed at a meeting of the A I T Executive in Paris last

month and one may reasonably hope that before long a simple

made

The question of a
officers presents som
international debate
that in some countrie
by sounding his horn in a prescribed manner which way he wishes to turn Without this the police officer will not signal him on The countries in question doubtless find this a good plan but I cannot think that other countries will agree to adopt it in preference to their own simpler codes This question is largely a matter for conference among the police authorities but motorists should be consulted before any decision is arrived at and I am authorised to say that the A I T is willing to co operate with a view to framing standard rules

PASSPORT VISAS —So much has been said and written about the vexatious visa that I will assume the arguments in favour of its abolition are accepted by the majority of those who consider this paper We in the Automobile Association know that it *does hamper international circulation Apart from the question* of expense—which for an extensive tour might amount to £5 or £8—there is the labour of securing the visas on the eve of de parture A visa omitted means that the motorist avoids the country in question

Recently 12 000 members of the American Legion came to Britain The visa fees chargeable totalled £24 000 Had they *not been remitted this great party—it is reported—would not* have visited this country What is common sense in the mass is equally so for the individual Rational views are prevailing Already visas have been abolished by many countries and the time may come when the passport itself as well as the visa will no longer be necessary for the tourist

INTERNATIONAL ROUTES AND MAPS —Our friends of the Swiss *Touring Club have shown commendable enterprise in producing* maps to portray a model network of international routes Switzerland being centrally located is able to give to the roads on a general map an orientation less biassed than is the case with —for instance—the map the Automobile Association of Great Britain has in course of preparation The A I T is considering the new Swiss Map and I believe it may be possible to agree *upon a system of routes to be prescribed as International* The next step would be to secure Government recognition of these routes as roads deserving of special attention not merely with regard to surface and signposts but also in the matter of frontier crossings

By joint action we may hope that Europe will achieve trans continental highways on which international traffic—both tour and commercial—would circulate so freely and speedily that

schedules maintained by the railways could be approached. Special motorways will some day be built in all directions but without waiting for these the improvement of a classic system of the existing highways might well be projected

To return to the question of maps The tourist to day is confounded by changed names and names spelt sometimes in Roman and at others in unfamiliar characters For some years to come it will remain the practice of the A I T to give to its members both the old and the new names and to use Roman characters

I would suggest that in the interest of international travel by road, names on signposts and names of villages in countries where unfamiliar characters are used—should be displayed also in Roman lettering

Rule of the Road —In no contentious spirit I claim that the rule in Britain of driving to the left is older than the contrary rule In any case the claim is immaterial because the fact remains that most civilised countries keep to the right Most but not all as the following schedule of countries for which the International Travelling Pass is available shows —

KEEP TO THE RIGHT

Algeria	Holland	Poland
Belgium	India (French)	Roumania
Bulgaria	Italy	Russia
Dantzig (Free City)	Liechtenstein	Sarre Basin
Denmark	Lithuania	Spain
Egypt	Luxembourg (Grand Duchy)	Switzerland
Finland	Monaco (Principality)	Tunis
France	Morocco (French Zone)	Vorarlberg (Prov of Austria)
Germany	Norway	
Greece		

KEEP TO THE LEFT

Alderney	Great Britain & Northern Ireland	Jersey
Argentine	Guernsey	Malta
Austria (exc pt Vorarlberg)	Hungary	Portugal
Czecho Slovakia	India	Sweden
Gibraltar	Irish Free State	

The left hand countries—including Britain—will concede that if any change is to be made it will fall on themselves to make it Unfortunately that is not a decision easily arrived at To change from left to right—or vice versa—involves great expense It would certainly cost Britain a vast sum of money Every omnibus and tramcar would have to be reconstructed Every motor car would be depreciated in value Every manufacturer would be compelled to alter his designs Tramway crossings would have to be altered and changed over and street

I do not consider

e sake of securing

uniformity will be within the sphere of practical politics for many years to come

Portable Wireless Sets —Wireless telephony is as yet in its infancy, but already portable receiving sets are becoming popular

as equipment to be carried on a motor car Great difficulties are encountered by a motorist desirous of taking his wireless apparatus on an international tour Some countries prohibit the importation Others restrict it Others impose rules not easily complied with but there are others which allow the wireless set to be entered on the triptyque as part of the equipment of the motor car

Until all countries that recognise the carnet de passages en douanes permit the addition among the prescribed accessories of a wireless set that document cannot be used for the purpose of its importation

What is needed now—I submit—is a general recognition of portable wireless receiving apparatus by the Governments which sanction the triptyque and the carnet and also freedom for the tourist to use his set without being called upon to take out a temporary licence

TAX CONCESSIONS —Another object to be striven for is reciprocal freedom from all motor car taxes for a certain period so that visiting motorists can pass unhampered through all countries Several countries already grant certain immunities from taxation to the visiting motorist Great Britain and the Irish Free State allow four months exemption Italy allows three months exemption from its national tax but not from its provincial and communal taxes Some countries like Belgium Holland Spain and Norway grant immunities on the score of reciprocity to visitors from Great Britain and other countries give similar exemptions

Inasmuch as the visitor spends a good deal of money in a country that country is helping itself as well as the tourist when it grants him such exemptions The various governments have already recognised the value of the motor tourist by approving the triptyque regime and by formulating the International Travelling Pass It would be a step in the same direction to forgo the motor tax (and visitor taxes) and the passport visa

If we can smooth out the tourist s path much traffic will flow along it

COMMERCIAL TRAFFIC —My paper deals with International Touring and therefore precludes reference to commercial or industrial traffic in a wide sense It is proper however to refer to the fact that the A I T seeks improved amenities for the motor coach across frontiers under cover of the triptyque and carnet It can be urged that this vehicle should circulate as freely as the privately owned motor car or motor cycle

If all the countries on the carnet would agree that the motor coach could circulate on that document there would be no need for the Association or Club to collect the duty for each country for which triptyques—at present—may be issued I might mention that the Automobile Association of Great Britain had recently to be indemnified for about £6 000 in connection with the issue of triptyques to one motor coach proprietor and the time came when the owner did not wish or could not put up more duty with the result that no more triptyques could

issued If it had been possible to issue a carnet de passages en douanes and it would be if all Carnet countries extended their triptyques to motor coaches the amount of the deposit required would have been only the highest amount of the import duty and taxes imposed by any country for which the carnet is available We know certain conditions are laid down by the various countries such as forbidding the picking up of passengers en route but I think it will be agreed that if a carnet could be issued in approved circumstances it would be a means of further popularising travel by road by the public other than private car owners

INTERNATIONAL MOTORING DICTIONARY —A difficulty with which the automobilist is faced as he drives from one country to another is to make known his requirements when these are of a technical nature relating to the motor vehicle The Touring Club of Belgium has produced a useful polyglot dictionary and phrase book which deserves to be more widely known

HOTELS —Thanks to the enterprise of the hotelier the post war improvement of hotel service for motorists has been remarkable despite the difficulties of fluctuating exchanges and their reaction on the direction of the tourist stream No one wants to see hotels standardised on a rigid model Variety is the salt of a tour and the chief considerations are good food and lodging, local specialities fair prices and personal attention For the rest I may be permitted to add that for the past 16 years the Automobile Association of Great Britain has had in operation a system of hotel classification by stars which, taken in conjunction with the prices published in our annual handbook, serve to guide the motorist to the type of hotel he desires This is most popular

GARAGES —The provision of good garage service is largely an economic matter A country which has few motor cars cannot be expected to offer many good garages A great deal, however can be done to effect improvement and to provide suitable facilities by work of organisation undertaken by associations of motor owners and by societies representative of those engaged in the motor business

The powers of management of the Society of Motor Manufacturers and Traders in Britain may be judged by the arrangements for this World Motor Transport Congress for which the [illegible] responsible Similarly the whole motor trade in [illegible] organised and our garages are a reflex of that

[illegible]

cross[illegible] [illegible]ion of the tourist there is scope for im[illegible] refuges [illegible]al garage service He requires attention These [illegible]nds, not infrequently, that the make of the idea of [illegible] known to the garage at which he had uniformity su[illegible] spare parts can be obtained for it many years produce[illegible] struction manual which details the

PORTABLE [illegible] or [illegible] ent, the garage mechanic may not infancy, but al[illegible] the language [illegible] which it is written

Perhaps this may suggest a line of action to members of the Motor Trade attending this Congress Bi lingual instruction books would—in most cases—circumvent the language difficulty in Europe

I believe that in each country, where motor vehicles are pro duced, a great deal of good work is being done to standardise various components It would be interesting to know to what extent standardisation is proceeding on international lines Pro gress in this direction interests the motor user, and would doubt less solve some of his problems when he is in need of simple components in a foreign country

PART III —CONCLUSION

I have endeavoured within the limits of this paper to survey the principal improvements in the facilities for motor touring by road which—if made—would serve to stimulate circulation

Some of these are immediately practicable For others we must bide our time and work quietly by conference and collabora tion for their ultimate attainment Evolutionary rather than re volutionary methods must be used

The Alliance Internationale de Tourisme has a wide outlook, and it seeks to use its influence for the good of international touring It
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for protection All must be considered The A I T supports the Conseil Central du Tourisme International, founded and pre sided over by M Edmond Chaix the President of the Touring Club de France At the seances of the Conseil Central, repre sentatives of Governments, Railways, cyclists, pedestrians, aero clubs and motorists, meet—as they did last month—in an earnest
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If this Congress will re assemble from year to year as a permanent body, that will be good But in any case there are here present delegates of Associations and Alliances, who will take away with them pe
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per cent to 20 per cent each year, and judges that progressively, as the restraining formalities are relaxed, and as road and mechanical improvements increase, the traffic will grow immensely within the next ten years On this anticipation is founded its determina tion to use every effort to ameliorate the conditions of motor road travel

Road Traffic Congestion and Other Problems.

By MERVYN O GORMAN C B D Sc M Inst C E

Vice-President of the Association Internationale des Automobile Clubs Reconnus
Vice-Chairman Royal Automobile Club

Submitted on behalf of The Royal Automobile Club

1 With the advent of motor vehicles road transport has been industrialised thoughts are directed to organising it on first principles much as a factory might be Matter in the wrong place is dirt but when moved to the requisite place is wealth Road traffic to day as in the past is concerned with changing the place of matter mainly with this wealth producing objective in doing so it employs labour and capital but it also takes time The quicker it goes the less time it takes and for any given amount of transport equipment the more wealth it produces per day and the less it congests the roads

2 Alternatively we could get the larger amount of transportation per day at the slower speed by using more equipment—up to a point As I shall try to indicate later too much equipment i e traffic units on a road actually causes strangulation of flow and diminishes the total amount conveyed, thus increases the capital unproductively locked up in transport equipment, in goods on the way and in road value

3 No experiment has been made in any country to determine at what traffic density strangulation occurs, and consequently no legislature has yet enforced the economical means for preventing it and retaining the maximum flow Private enterprise has introduced double decking the traffic, as in buses in pillion cycles, and in vans with increased useful tonnage to the unit This principle should be extended further An example is the London taxicab By removing the charge for extra passengers beyond two, the extra cost to the cab owner is not measurable, the extra road space used is nil and encouragement would be given to the use of cabs by parties of four or five who could divide the fare and relieve the buses while improving the cabmans' turnover Increasing the tonnage of the traffic unit is, however a palliative limited by axle loads—until we further develop

the caterpillar—and leaves us still in need of regulations to secure the maximum safe flow even of these improved units

To increase the speed safely up to the road capacity has no economic drawbacks To limit the speed whether by overcrowding by restriction regulation or by the disorderly or the slow movement of the traffic units makes for congestions which are immensely wasteful and the birthplace of accidents Speed limits have been imposed in the past in nearly all countries—in England four miles 12 miles and 20 miles per hour On each occasion the many have admired the handiwork of their legislature though it was detrimental at the time was urged to be so by automobile engineers and has been proved so since

Progress has only been achieved through the educational effect of offenders who have continually ignored the law If at any congested place speed can be safely increased any transportation that is approaching congestion there can be achieved with less vehicles on that place therefore with a freer road—and a freer road reacts to make such speeds safer The hinge of the traffic problem is the safe increase of speed Speed is cardinal and safety is cardinal and these are not alternative cardinals but one cardinal That is to say increased safety of transport and of pedestrians is not to be confounded with a diminution of accidents per day What the world demands is less accidents per quantum of traffic flow!

Such generalities move us to recognise the urgency of the following which it may be suggested are among the definite duties of any civilised government —

(a) To help as best possible all units of traffic to their destination
(b) To provide them with every safeguard as they go
(c) To arrange for an economic return for road expenditure
(d) To provide for raising funds justly to meet road expenditure

This tolerably obvious programme is not from internal evidence the inspiration of the road traffic laws in any country as yet and what is worse many of the traffic units as well as the authorities are opposed to any such programme save on the condition that so far as its fulfilment demands continuous control of traffic behaviour and its assistance by signs and naming &c any such or less are to concern all others but not too much themselves Among examples of this attitude in England in addition to that of the pedestrians who up to now have resisted the introduction of any orderliness in their behaviour or any code of road

maximum flow which they all desire We have in England be

of the opposition of shopkeepers to one way streets and to by pass roads to the rounding of street corners &c The Londoner also offends aware as he is that nothing but the submission of his 94 road authorities to some unified directing authority will ever solve his traffic riddle he has utterly failed to bring this about District and urban road authorities who must be aware that the governmental duty (a) above involves posting up the names of their towns and villages still fail to do this or leave it to private enterprise In London notably and everywhere in some degree the naming of streets is neglected and this is a potent cause of stoppages and congestions

If road traffic congestion is to be relieved and easy flow secured nationally or internationally the first step is to get a consensus among road users in each country that their governments shall be compelled to unify and control their myriad road authorities and oblige them to carry out the four duties above enunciated in a non parochial spirit Action of this kind is being set on foot by the more energetic of the Automobile Clubs This action is concerted at the meetings of the Association Internationale —called the A I —and the first success of this move was to secure recognition by all governments of the series of agreed danger signs and warnings In this the collaboration of the A I T —as the corresponding touring body is called—was received and was very valuable This work advances slowly because the traffic authorities are everywhere inert Their inertia is due mainly to the ignorance and slackness of the public whom the authorities follow instead of leading

6 *Traffic Data* —Correct broad thinking on traffic flow is necessary and this must be guided by the data the facts of experience We need two kinds of view points for traffic problems—wholesale and detail The one is the bird s eye view such as a man can get from aircraft overhead and record with photographs or the cinema the other is the worm s eye view as by those who are units immersed in the traffic Both are important But before we consider either we want something wider still—a general financial view—the money data which will tell us whether we are dealing with millions or thousands of millions These data would if we could get them gravely affect our estimate of what is legitimate expenditure for betterment for avoiding accidents for acceleration of flow and for experiments on traffic conditions

7 *General Financial Matters* —It is usual to accept that Road Transport is a wealth producing industry—and leave it at that Further consideration may be instructive though I cannot in absence of the data about England or any other land make definite deductions, it is simplest to take a fictitious country so as to make clear by example where such data would be useful

Imagine an island in which we decide to have 178 362 miles of road with bridges, etc , which cost about £2 000 millions to make

	£
Write down this sum to a capital of say	1400 millions
Add Vehicles, horsed and motor driven say	50 ,,
,, Goods at any moment in transit	50 ,,
, Vehicle, factories, repair yards, road plant, etc	100
The Capital* engaged would be somewhere about	1600 millions
The upkeep of roads and vehicles, fuel, oil, insurance policing lighting, etc, per annum	150 ,,
The interest on the capital of £1,600 millions	80 ,,
The annual equivalent total, though not seen as expenditure would be	230 millions

This great burden must be borne (in part directly and) mostly indirectly by the islanders In the long run it is referable to the goods (and people) carried It may be written as a charge of so much per journey on each £1's worth of the things transported

The total value of goods carried in a year we will, since we lack the facts, call £2,300 millions, lumping together people these assumptions the average per cent or two shillings for 0 per cent or even 1 per cent is a fraction big enough to deserve study and to influence trade turnover

The speed of conveyance on the Island of the average ton is is, say, only 8 m p h †—owing to congestions at many points in the Island—even in a year of depressed trade Now it appears unquestionable from the increasing demand for transport elsewhere in the past that there will in future years be an increased demand of at least 50 per cent in about eight years, say, 1935

8 How are the Islanders to prevent the occurrence of a serious block then, and what amount of expenditure is warranted in road widening, bridges and clearings in anticipation? Of course, if the average speed of transportation could be put up to 12 m.p h (from 8) the problem would be cheaply solved, provided this increase of average speed did not involve an increase of maximum speed (That is to say, if the need is only a clearer

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run through the points of congestion, and not a general increase of *facilities throughout the roads*)

At 12 m p h average the same number of vehicles would achieve the 50 *per cent increased work wanted in 1935, hence* the expenditure in motor vehicles would not be increased As all or nearly all the vehicles are already suitable *for* 12 m p h and more as the same number of drivers would be employed and the road and tyre wear would be substantially unchanged the expenditure within a few millions would be unaltered Now speeding up the traffic flow in this way would have the effect of distributing the annual expenditure of £230 millions over £3 400 millions worth of goods (instead of £2 300 millions) thereby bringing down the two shillings for the transport of each £1 s worth to about 17 pence and putting into the hands of the *Islanders the difference viz 7d per £1 or say from £50 to* £100 millions annually available to pay interest on the capital cost of the work of *clearing congested places* Please note that I am advocating nothing—only remarking it

Such an annual sum represents eventually the power to borrow £2 000 millions a sum which could surely not be required for clearing congestions since that amounts to the original value of all the roads on the Island

9 I do not wish this Island parable to be considered as more than a diagram to show on the one *hand that we have not got* and on the other that we need to possess correct and full statistics and *financial data concerning road transport* before we can express a reasoned view as to what are or are not proper and profitable expenditures on improving the transport conditions These financial statistics I ask for now As to getting an impr[illegible] [illegible] for the average ton I indicate later some experi[illegible]ents [illegible] lead one to hope for great improvements in [illegible] *little expenditure* of public money no increase of [illegible] and only a proper and *decent expenditure* of goodw[illegible] traffic units

10 These [illegible] *wide of the mark* for the Islands of Britain suggest that r[illegible] transport is a very large business here and they lead to five conclusions —

(a) That correct data of th[illegible] are necessary to form a judgment of the values at stake in the Transport problem and therefore on the validity of any expenditure its amounts and its urgency

(b) That when we study *such data we shall see the Transport* Industry as a great fertilising wave moving over the land enriching the lives of all

(c) That the motor car construction industry of England for instance, with its £60 millions of capital and £125 millions turn over, great as it seems, is but a cockle boat on that wave

(d) That the wind and tide behind that wave are the economic demands of all interests and classes—*and not those of motorists* bicyclists or agriculturists in particular

(e) That this rising tide is of the kind that cannot be stemmed by sitting on the beach and grumbling at wet feet i e the risks of accident

There are of course risks All industries involve hazards but we need to know the ramifications and the magnitude of a business before we can weigh the pros and cons of even such a toll of life as the 4 300 who suffered on British roads last year (1926)

In the course of these notes I make no suggestion for any cure of congestions by means involving capital expenditure I am here to advocate administrative measures and above all considerate driving—the dominant cure for the self strangulation of traffic

It will appear that the very orderliness which will speed up traffic flow is just that which will diminish accidents and more over speeding up in this way will become a civilising agent by developing that considerateness and self control which it is innate in us to admire Reciprocally we can see without teaching that a self impeded individual is always pitiable even when he annoys whether he be a stutterer a drunkard or a capuchin ape* or a motorist

We do not seem therefore to need a change of heart but only an indication as to how we shall best be considerate and orderly For this we require experiment and thought

11 *Bird s Eye View* —The use of the airship or kite balloon or aeroplane with the cinema camera for securing generalised and detailed information has I think been regrettably neglected We need quantities of accurate and complete data and records—at every congestion—not only numerical counts at arbitrary places Generalisations from statistics are little more than

I

I noted by passes almost unused near crowded crossings and realised that these were unusued chiefly because once a vehicle is in a stoppage it is in a trap whence it cannot retrace its path and this because its fellow sufferers are so close to it that neither it nor they can turn on their tracks to take a known open path Yet this extreme closeness has no advantage in increasing the flow (see appendix II)

On the other hand I knew by recollecting my previous worm s eye view that except for buses streets were mainly blocked by vehicles whose drivers had no particular preference for the knotted localities but only got there because the finding of the alternative route is extremely difficult

* See Road Traffic Problems of the Pedestrian Royal Society of Arts 9th November 1927 by M O Gorman

12 Aerial maps of London traffic prepared before and after any experimental charges are made in roads and road regulations are I think seriously needed For congested streets a series of movies say of one exposure per second of the traffic behaviour at such spots could give us facts speeds positions knowledge of vehicle types or manœuvres which may help or impede flow such as could not be jotted down with like accuracy by hundreds of policemen with note books

The attraction and also the difficulty of starting such an aerial study of traffic is that it seems to promise—and indeed require—such an immense development owing to its usefulness

Much traffic is seasonal—traffic is affected by the day of the week and by the hour of the day For example Why where and how were Fridays 50 per cent more fatal than Mondays in 1926 in London Aerial surveys could surely answer such queries and perhaps indicate a cure for the trouble It is in enquiries such as these that the surviving pedestrians are deeply interested Their votes could help us to an air survey and the air survey could help them

Such an aerial service like the municipal scavenging service would cost money and yet would be cheap in relation to the money and health issues at stake and both are concerned with life and death

13 To take one example of the potential use of aerial records to a study of safety on the road We can see that we must know the quantity of traffic flow per accident if we are to know whether and how far any factors—the lapse of time the increase of vehicles or of pedestrians in certain localities new regulations extra point duty police or structural change at any place—have bettered or worsened the accident position or the flow Such betterment may be at that place or at some other distant spot, or at both or neither

14 It is essential that the quantity speed and nature of the traffic flow be known if we are to appraise the improvement in accidents in relation to the quantity of traffic flow with which that place or street is concerned To day we can only take a vague criterion of the quantity of traffic flow for all London by an elaborate and necessarily unreliable process as follows — Thirty nine ' passing points have been chosen about the town as representative points and at these a count is continually made The London traffic flow thus calculated in the years 1920 to 1926 is given in the Traffic Committee s report * That there is a basic value in knowing the quantity of traffic flow is admitted by the mere fact of the Traffic Committee trying to make such

* See Report on Street Accidents in Greater London March 1927, published by Ministry of Transport and prepared by the London and Home Counties Traffic Advisory Committee —An admirable document in the view of the present writer

a count, however vaguely approximate the result may be It is as follows —

Year.	No of Vehicles passing 39 points (000 omitted)	Year	No of Vehicles passing 39 points (000 omitted)
1920	817	1924	1,054
1921	834	1925	1,041
1922	895	1926	1,126
1923	942		

and it reveals a 38 per cent increase in six years

15 This increase shows the immensity of the problem which will face London, in another six years, say, 1933, whether we consider its effect on our purses, or on our chance of getting to work in time each morning Alternatively if we prevent London from growing we shall know the pains of that Chinese torture which doubles up a growing youth in a cage—and notes his agony But this is by the way My point is that we need to know the basic fact of the flow rate at each congestion We want it in detail, its volume its character, the size of the units, their speed before and after each traffic experiment, so as to note the changed results whether the experiment be a regulation to form roundabouts, or road widenings or white lines, or the placing of refuges, or rules for the proper spacing of vehicles, or an alteration in the number of hours allowed at a parking place, &c

Who can say without timed photo records what has been the resultant effect on the congestion at Piccadilly Circus of the improved flow arranged at Hyde Park Corner, or of diverting or augmenting a 'bus service, or what would be the effect on any one road such as the Edgware Road of enforcing for six months a strict keeping to the left of the available road space, or on Piccadilly of the simultaneous releasing of a series of traffic control points?

16 Statistical observation will be [illegible], but a count of vehicles is not enough How [illegible] at six m p h are equivalent to one 'bus [illegible] at four m p h, or does each vehicle from [illegible] one? If we had the aerial cinema records [illegible] leisure, reeled off slowly and analysed for [illegible] the units at any date and for any purpose.

No doubt the technique of such aerial [illegible] worked out and there will at first be waste [illegible] hand, there may be novel gains; for [illegible] munication from traffic-observing balloons [illegible] police were to take a place in the course [illegible] not at all impossible for an unwilling [illegible] a proposal into an expensive failure and [illegible]

but this is unlikely Success is a question of will ingenuity and work and involves the recognition of—

(a) the urgency of the traffic question and its growth

(b) the great values involved

(c) the fact that the business of experiment is the business of trying till you succeed and therefore some degree of failure is inherent in all experimentalisation

(d) no other means of accurately collecting all the data—especially the effect on the speeds of the different categories of vehicles—exists

I have advocated aerial photo surveys because I can think of nothing better for reaching the necessary data and not at all because I have been mixed up for 18 years with aeronautical research Any survey will do which provides measurement of small increments of safe flow and relates them with a known singly applied variation of regulation or control &c

17 Hit and miss intuitions dodges controls signals rulings groupings spacings bridgings clearings tunnellings by passings surmised to be useful by amateurs are all so much irrelevant matter—motes in the eye of the investigator impeding his progress unless they are used as part of an experiment where experiment means measurement of small changes and the measurement is related to a known variation with other factors kept as constant as possible

The experiment which proves a definite device tried to be bad if that trial is part of an ordered scheme is just as essential as the experiment recorded is a good result The amount of the goodness or badness is what we want to know and that knowledge is the only warranty on which to decide the worth whileness of the trial

The progress must be slow and that slowness makes early starting the more urgent because the increase of both pedestrian and vehicle traffic is unremitting and rapid

18 I have been told that it is unrewarding to try to help the pedestrian or bicyclist because they are not only intractable and unobservant but pugnacious to the point of unseating any government that tried to guide them I disbelieve this but even were it true it is useful knowledge of one particularity of some of the elements with which our chemistry is concerned to deal Even explosives have been harnessed to the service of industry They too are pugnacious but we know it we sublimate and direct that quality and so use it

Resuming, in the words of George Catlin on a widely different subject—

Our first task is to observe what actually does happen

Our second to put forward some carefully selected explanation of why it happens that way

Our third to test that explanation by further observation more specified and detailed "

Obviously the variant to be first tried should be supported

by an exposé of some probability that this will give useful information That is the utmost that I claim for a number of sugestions in this paper In had the advantage of comparing 1 hers who have other and wider so hese is among the objects of such a paper

19 *Authority Needed* —A dominant difficulty at present s the absence of any authority at any rate in England who has the right to pronounce that such is or such is not the custom of the road Still less is there anyone who can promulgate desirable alterations to a custom The Minister of Transport has no such powers and regrettably as I think he has not even asked Parliament for them

It may be asked if orderliness is so valuable why not go further than to ask merely for the official registration of customs as such Why not actually invite legislation making these good customs mandatory and their neglect punishable? That would be I think most undesirable The reasonable spirit needed for good traffic flow is strong against this The inordinate multiplicity of the circumstances which arise on the road make a law too rigid or alternately the law would be so qualified by exceptions as to be unrememberable

The purpose of registering and making clear what the road customs are is not only that the traffic may be able to know and abide by them or contravene them with due circumspection but equally to ensure that there be no two sets of people each obeying loyally customs which clash The making of a code necessarily involves cutting out all clashing customs or harmonising them, and for this a single authority is necessary In England we have 1 300 road authorities and they act on a Transport Minister like fleas on a dog They prevent his remembering that he is a Minister of Transport

Examples of Customs —It is a point mooted to day whether a led horse should as of old in England be walked on the right of the road As a fact he is often walked on the left because other traffic sees him earlier on blind corners which bend to the right and also because of the widespread left habit with grooms who are chauffeurs also A car we know should take the left It seems to be an agreed point that a led horse should take the edge (or the hedge) and this more important rule is liable to neglect when the horse changes side as above

Another example —It is the present custom for the driver in a minor road to cede place to the driver in a road known to be a major road without any decrease in the liability of either for an accident Some people have proposed and advertised a new custom which clashes with this The new proposal says that if the driver in the minor road is on the right hand of the other, then he has prior right to proceed Any two drivers obeying each a different one of these two formulæ risk collision at some

time It is imperative to have an authoritative decision one way or the other And there is no one to give it

There are other examples but the point need not be stressed There must be one code only of customs and therefore someone to decide it When there is one agreed code it acquires sufficient actuality to be susceptible to improvement with use or by acquiring experience from abroad or as the result of experimental orders at home It is an entity that can be forged into useful shape—you cannot forge a vacuum

Meanwhile the best I can do is to put forward for consideration appendix III some items for a code of the road that I have come across—and hope for their improvement by constructive criticism and eventually their canonisation with or without alteration by the Minister of Transport when he does as I think he should take on this responsibility

From now onward [illegible] of selected road traffic problems [illegible] separately as examples rather th[illegible]le intricate subject The only generalisation that pervades them all is that considerateness wisely instructed is the greatest of traffic lubricants but I insist that considerateness to be useful must be made as general as possible and kept under one controlling and guiding authority It is in this guise that I would advocate a full measure of obedience for our own advantage not to mandates or rigorous laws but to wisely selected road customs

20 It is of no use trying to cure congestions after they have occurred If administrative measures are to do anything it must be by introducing orderly flow before the traffic has got into the congested state and for that purpose we must begin operations on the clear and easily flowing stream

I begin by introducing the Keep to the Left Custom The first the most useful the safest and therefore the most needed advance in the code of the road is the extension to universality of the custom Keep to the Left Simple as those words are I have found that they need explanation When understood they voice a policy of individual self denial and therefore may awake some opposition I am anxious they should convey no meaning which is not intended such as might make for their logical rejection

To begin with I advocate a custom not a mandate or a law that is to say there must be such elasticity as will release the pressure in all justifiable difficulties without negativing the custom For example in another sphere of the world s customs a man does not take his hat off to a lady friend if he is carrying in each hand a large Christmas parcel yet this does not cancel or alter the etiquette—the custom

The Keep to the Left slogan is an abridgement In extenso it means that every driver keeps as far as safely and decently possible to the left of the available roadway

It does not mean that when a road is so cambered or so slippery as to make keeping to the left dangerous the driver need do so

It does not mean that when the gutter is full of mud and the footway full of pedestrians the driver must pass in the mud and splash them especially when further towards the road crown there is a good surface with no one on it

It does mean that after any such excursion towards the road crown the driver takes care to return so as to make as much of the road on his right available for the use of others who may want to overtake or pass him He does this by reverting to the left

Suppose a driver to be well on the left and proceeding down a road this custom does not mean that where a somewhat blind tributary road joins his road on the left side he is bound to remain by the kerb so closely that he cannot see traffic coming out of the tributary road till he is on top of it It does mean however that if he has swerved out for safety at such a place he returns to his left or proper side when the cause for swerving out is passed

21 With all these exceptions why call this custom one of self denial? It is because the driver's course is rendered more sinuous and his attention to the wheel is rendered to that extent more exacting In return he will as soon as the custom catches on get to his destination quicker with less maximum speed less wear of roads less hooting and less wear of tyres I might also add with less enemies Lastly when he gets into denser traffic he will be far less a cause of initiating congestions

There are few road users who have not noted with approval that such or such a cart or traction engine or charabanc or car was on its proper side when they were driving to overtake or even to pass it This word proper is a tacit admission of the existence of the custom yet these same road users who appreciate what is proper in others and the advantage which this proper conduct bestows will themselves stay on the road crown till they are hooted off by some other driver This shows a lack of imagination not necessarily any ill will

22 The Keep to the Left habit will on country roads result in better distributing the road wear now so regrettably concentrated upon the two wheel tracks which span the crown In so far as this wear will be spread over four tracks the life of the road crust and therefore the comfort of the drivers will be increased if not doubled Surveyors will foster this economy of wear by introducing appropriate road banking* on curves and avoidin

As to by keeping
to the
or it might be a
of a 20 ft road

* See Ernest Leonard Leeming's paper No 50 before Inst Civil Engineers 1 2 The Superelevation of Highway Curves

direction does not and cannot know how early room will be made for him, that is, adequate room in view of his own estimate of his skill in driving along a narrow slot Well in advance, because he cannot see through the vehicle, he hoots, then he decelerates, he applies his brakes, when he is quite close, and usually not till then, is adequate space made for him This is bad economy

If he had been overtaking the charabanc from behind, he must approach within earshot of its driver and hoot, await the signal of recognition, await the drawing aside of the obstruction and now accelerate from his slackened speed till he is able to over take and clear More often than not, the passage space for overtaking thus freed is by reason of the delay, found to be barred because he may not overtake on a blind corner, or because an oncoming car is by now rather too near He loses his chance and the whole process has to be repeated—to no one s advantage at a cost of time, tyre wear, brake wear, road wear, noise and petrol, which in the aggregate must be enormous The cure is simply Keep to the Left even when you think you are alone or that you own the fastest or the biggest car on that road The white lines are merely a local expression of the need for this custom in places when the urgent need of the custom is such that it has had to be written on the road face The lines have sensibly increased safety and freedom of movement

23 *White Lines* —These must not be regarded by local road authorities or police as simply a new means of putting the motorist in the wrong If the order conveyed by that white line is not to be transgressed then the local authority that inscribes it must forbid its local vehicles from standing within the area which the white line protects Pedestrians must not allow them selves to stand in gossiping groups on that part of the road where they themselves as local ratepayers and voters have ordained that the white lines be placed, because of the risks! Yet they do this continually and uncensored under the eyes of the local guardians of the road So long as the villager ignores his own white lines the motorist must needs ignore them too, and by protracted abuse the lines will cease to mean, and cease to afford the protection due to orderliness in traffic

24 The Keep to the Left custom is a custom of self denial for another reason Since it involves a more sinuous course, it involves more signalling of the kind known as hand signalling—though it may be better achieved by a mechanical or electrical device It is a good custom that when a driver intends to alter his direction or swerve from the left of the road towards the crown for any such good reason as has been instanced the driver must in advance let the others know, and he should act as though expecting always, or nearly always, the presence of others

I will now assume that traffic generally has in its own interest adopted the habit of keeping to the left of the available road space, and having thus travelled clear of countless unnecessary obstructions—such as we are accustomed to meet in our present

unreformed regime—arrives at a town where the number of vehicles is such that a perceptible slowing is produced simply by their extreme propinquity This is the beginning of a congestion When a cross stream causes the leaders to halt and all the vehicles pile up as near to one another as they dare be driven without scratching the varnish we have that which when frequently repeated is congestion in being

25 *Roundabouts* —To handle a cross stream so that it does not cross and stop another but flows into and through it the two taking for a brief space a curved track together is the function of a roundabout A roundabout should therefore be a potent remedy for congestion But let us see

Though a non stop roundabout* assists traffic flow it fails when it stops rotating and this already occurs fairly often Thereupon the evil of the traffic queue reappears in the confluent streets

The roundabout is meant to allow traffic infiltration from its feeder streets into the rotating stream but note that whenever the units in the rotating stream are nose to tail the infiltration perforce ceases Here again the traffic queue has to reappear in the confluent streets a daily occurrence which can be obviated as I believe by heeding the lesson of the following diagrammatic experiment—and the proof given in Appendix II

Imagine some deserted road to be a closed circle 440 yards in circumference Put on it one modern taxicab with orders to circulate clockwise ceaselessly at say 30 miles an hour Then increase the number to five ten 20 40 55 etc taxicabs until at last a maximum of 110 taxicabs in on the 440 yards Though all drivers have orders to circulate clockwise at 30 m p h they find that when their number is such that they are nose to tail they can barely go at four m p h In fact as the clear space in front of each car gets less its speed gets less and less

The explanation is of course that the driver should not and in fact does not because he dare not drive behind another object much nearer than the distance within which he can pull up since that object may rapidly stop

There is however some intermediate number of taxicabs which I will prove in an Appendix to be about 55 or one half the full road loading when if the drivers are careful to space themselves equally they will all be able to drive at say 15 m p h

Such an observation is uninteresting till we notice the fact obvious enough when pointed out that 55 vehicles at 15 m p h give nearly twice as much traffic flow as 110 vehicles at four m p h or that nearly twice as many cars will be cleared past a given point if
length between them
in as tightly as they c

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* See Times 2[illegible]th April 1927

confluent roads makes the circular track of my example differ from a roundabout but the need for infiltrating the side traffic into the latter makes the proposal which I now make to maintain spaces between the cars in a roundabout more necessary, not less

26 A number of conclusions seem to flow from this experiment prominent among them is the fact that every circular roundabout must have a minimum diameter to carry the load of its confluent roads without being overloaded that is obliging any of the tributary streams to stand still and as it will certainly cease to accept any contributions when its vehicles are nose to tail we get the means by which we can decide what the diameter must be Thus Londoners can see at once why the Piccadilly Circus roundabout so often fails It has six tributary roads and it is overloaded There is another reason

Since the principle of the roundabout is infiltration it is cardinal that all entry into the circular roundabout be made tangentially to the circle—and this can only be got if the mouth of each confluent road is flared to enable entering traffic to flow in with the stream instead of first entering across the stream and then turning Similarly departing traffic must flow out tangentially The Piccadilly pavement line is at fault here also

The circulating traffic is frequently—and in some parts constantly—nose to tail and therefore we are throwing away and wasting the potential ability of all these vehicles to move safely at 15 m p h The drivers are willing the engines are capable and the brakes are adequate—only the administration is at fault This can be remedied by introducing spaces and maintaining them insistently despite the intrusiveness of skilful taxicab drivers and others The object of this is obviously to ensure that this road space overloaded to strangulation may be enabled to carry its maximum flow—or as near as we can get to it in practice—in lieu of half its maximum carrying capacity as at present

It becomes clear that wandering pedestrians introduce casual interruptions of the non stop character of the roundabout It is advisable for their health that they should not so wander over a dangerous circular track the essential character of which is non stop vehicular movement Moreover the wandering is not even useful to the pedestrian The maximum increase of their journey is trivial it is in the ratio of the diameter to the half circumference of the circle and if the inconvenience imposed is measured by time and safety and not in yards they are large gainers by *keeping to the circumference*

Lastly, when my 'spaces' have been introduced if ever they will make a speed of about 15 m p h obtainable only if horsed vehicles and others which cannot attain this speed are signalled off the approaches to the roundabout at least during the overload hours of the day

27 *Spacing on Straight Roads* —These same considerations appear applicable to relieve congestions in straight roads and to indicate that vehicle spaces are valuable in all congested streets

My suggestions may be vitiated by some peculiarity of side street entrances, of standing vehicles and of traffic temper of which I am not aware Possibly nobody else knows any better What is wanted is the experiment It could first be tried on any small circuit of country road using cabs and allowing no side road contributions to the flow This might be called a test model of a town road Then we might try later the effect of sharp angles on the flow in the test model road After that the effect of introducing the motor bus here and there later again the effect of occasional stoppages of any one vehicle on the whole stream Next the circular flow might be run in both directions simultaneously on say a road 20 foot wide and so on

The resultant effect on flow of each increase of complication needs to be recorded very carefully and as we approach the variousness of real traffic by some means as aerial photography

If these experiments succeed some one scheduled road in London could be tried and photographed Not only a roundabout but also a straight run either the spacing of the vehicles on my plan will increase the flow or it will not increase the flow The final verdict cannot be reached quickly when we start using the normal traffic of a town in the experiment The drivers would all at first be new to the spacing rule For a month or more individuals would probably break the rule to poach a personal advantage and thus crowd themselves locally and cancel the advantage to all—themselves included

28 I appreciate also that any thorough test of such a plan is severely handicapped because it involves no capital outlay It is well known that any public authority will exert itself *a outrance*, and will face all casual critics to justify itself and draw the last iota of benefit from any plan on which it has expended a handsome sum (*vide the tramways*) Not so for a device which can be abandoned with ease or delayed without reproach to assuage any signs of an unpopularity which I am the first to expect for any innovation in control

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to tail to pass through until he finds an interspace Then he extends the arm of authority to stop the driver who is deemed too late for the fair This is a strong incentive to close driving so strong indeed that to invert the procedure, that is to instruct the police on point duty, deliberately to retard the close driver at the traffic control points, would do much to enforce the habit of maintaining the " spaces " All this supposing that prior experiment had shown the modification to be useful and worth enforcing and, as I hope, tending to diminish the accidents in relation to the increased flow

29 A public rendered ill tempered or mutinous could make the trial a failure without great difficulty, and this means using explanation persuasion and publicity, such, for example as

could be given in advance in the ordinary cinema theatres and in the Press on the basis of the suggested preliminary open country road experiments with taxicabs

Next will come the trial on a genuine roundabout preferably a simple one the hope in all breasts that a roundabout might continue to rotate at about 15 m p h should assuredly be an inducement to good tempered acquiescence among drivers

Let us hope it may succeed—and help to avoid our spending say six millions on enlarging such a circus as Piccadilly Circus

30 *Cross Roads* —The large majority of cross roads in the land are not suitable for roundabouts and the safe flow of traffic over them is of the utmost importance I am anxious to secure this without the employment of a proposal called the offside rule which I think likely to conduce to delays and incipient congestions and accidents

Four cross roads are of course two roads that cross each other and as the risks in such spots have had wide discussion in which several solutions have been proferred both at home and abroad
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road which may be of greater traffic importance

(a) *Safety of Traffic at the Junction* —Whether the traffic be vehicles pedestrians or cyclists Britishers or foreigners safety must be the first consideration

(b) Responsibility —No driver whether on the inferior or superior of the two roads is to be relieved of his share of the responsibility for any accident that may occur or from his duty to take steps to prevent accident

(c) Flow of Traffic —Any proposal must be such as to avoid to the utmost impeding traffic flow compatibly with safety

(d) Easily Acted On —Any proposal must be such that the emergency which may arise does not call for sudden and unexpected application of a rule liable to misunderstanding misinterpretation or to being forgotten by one of the parties arriving at the crossing

(e) Applicability to All Roads —The proposal must be suitable not only to main roads through roads arterial roads &c, but must without alteration be the same for all roads to which it is applied though distinction might be allowable between town and country

(f) Applicability to All Traffic Groupings —The proposals must not be vitiated or lead to a doubtful meaning by reason of complexities of traffic or the convergence of many vehicles towards one point

(g) Cheapness of Operation —This must be considered to the last detail

31 Conforming with these requirements a scheme of Road

Warning Signs which will make cross roads safer is the following*

(i) All warning triangles which are not necessary must be withdrawn from main roads, and the convergence of tributary roads on to such main roads must not be notified by warning triangles —save when the tributary roads are not discernible 100 yards away by daylight—on the main roads

(ii) Conversely, in all tributary roads there should be placed warning signs at the statutory distance from superior roads

(iii) To distinguish the triangles erected in minor roads and used for this purpose namely to indicate the approach to a major road from a minor road, the triangles in the minor road should be erected point downwards This proposal is additional to and does not clash with other methods which may be used to indicate further which of two roads is superior e g placing the finger post of the superior road above the finger post of the minor or the sign which consists of a thick bar crossed by a thin bar as suggested in Belgium

(iv) At cross roads—whether the junction be visible from some distance or not—on the arbitrarily decided minor road, triangles are to be erected at the statutory distance, thus complying with the general rule (ii) above for all minor roads

(v) There are a few exceptional cases to be dealt with separately, such as Y roads and 5 way cross roads, &c

32 With a view to making proof of the workable character of this proposal an experimental trial on any long distance main road may be made and no doubt the procedure would be to urge upon the Ministry of Transport to take powers to make such experiment in an appropriate Act of Parliament, then to schedule the selected road and tributary roads, mark their approaches by

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Authority (or Local Authorities under centralised guidance) which shall determine to the best of its ability which of two cross roads, even if apparently equal, is to be, for the purpose of any one crossing, treated with warning signs as being the inferior of the two roads

33 It is recognised that a road may be superior to its lateral tributaries for some distance and then itself become a tributary

* This was put forward independently by Col Sinnot at the County Surveyors Society in 1923 and by the Royal Automobile Club's Safe Driving Committee in 1926, with slight differences in detail

or season then the accuracy of the designation principal road is not of such paramount importance as the fact that some road is marked distinctively as locally inferior to the other for the guidance of the road user

34 As regards the method of marking the roads I suggest a triangle The use of any text involving words such as minor road or your risk is less desirable than a symbol since *foreign drivers will not understand the words Moreover* the internationally agreed symbols must be kept down in number to the utmost on the score of the expense of varying the patterns since expense always results in delay in the marking of danger points

Lastly the triangle is not only the cheapest warning sign is universally agreed to by all countries is now becoming universally understood is available in stock in quantity but it can without adding to the number of agreed signs be made to convey additional information by the simple *process of varying its mode of* support To educate the public to this should be no more difficult than to make the public assimilate the fact that a cornucopia means a shop

35 *Against the Off side Rule* —That a general rule should automatically throw the blame of collision upon any one vehicle to the relief of the responsibility of another traffic unit is against public policy The vast number of qualifying conditions that may arise will eventually prove any such rule would work for injustice and under a sense of possible injustice all traffic movement would suffer I say this because an alternative to the above outline method of *protecting cross roads by the triangle has been* suggested It is called the off side rule *By this a driver* is called upon to consider himself liable to yield right of way to a vehicle approaching *him from his right If he proceeds he* alone is responsible for an accident that may result

I object to this rule on the grounds that (a) it does not add to the safety of the traffic because *until certainty exists that all* drivers will use it it is dangerous to rely upon it, (b) it wrongly relieves one of two drivers from responsibility in certain accidents which may occur (c) it would seriously impede the flow of traffic if universally and strictly obeyed (d) it is not easily remembered and acted upon in an acute emergency

dictory to the normal method of such signs giving an instruction by their absence or presence which is well known to all

36 So sweeping a condemnation of a proposal put forward by men of goodwill needs support at least by some example of grave inconvenience caused by the " offside " rule I give such an example in Appendix I

The proposal in para 31 subhead 1, to accentuate the value of the warning signs by withdrawing unnecessary signs on superior

roads does not mean that the user of a superior road is to go into a point of danger blindly Whenever the road junction itself is not visible from the proper distance or when the road junction offers some unusual character e g a five road junction or certain classes of Y or T junctions the triangle now to become by its rarity a respected and serious warning must be used

37 What has been called the inverted triangle solution of the cross road problem does not depend on the use of that particular symbol Col Sinnot of the County Surveyors

38 If it is possible to persuade the Minister of Transport to assume responsibility for codifying customs then I suggest this is a good one, and goes a long way towards easing the difficulty of rapidly putting up the warnings at crossings in the unclassified roads for the following reasons —

The 138 184 miles of officially unclassified roads in England are by no means so unclassified to all the drivers who habitually use them

The farm track the road with grass peeping through the gravel, the private drive, the field gate the narrow lane, the garage outlet the winding road of one vehicle s width, or nearly all these are an automatic warning in themselves that they are a minor traffic way, they are minor to any other road of superior width and surface They warn the driver on them to behave as if he had seen the inverted triangle

Next there are a goodly number of well surfaced roads for one vehicle, say, up to 12 feet width, where passing involves slowing to next to no speed These need no extraneous information to show they are minor, but at a junction the condition prevalent all along the path still remains viz , if there may be another vehicle look out!

When we come to roads of 20 or 25 feet width of good surface there are still in a very large number of cases some distinguishing features by which they are known to be inferior to big roads, such as the absence of footwalk or the kind of surface or the width It is when these roads cross one another that indication is most required, many of such roads have sign posts and by adopting a convention such as putting the arm of the sign post which points along the superior road, in the upper position cheap indications could be obtained which would be helpful to frequenters of such crossings

As no such convention for sign post arms is observed at present half the sign posts conform to this canon and half do not—omitting sign posts invented by the devil where all arms are at the same level Therefore since an arbitrary decision is sufficient

as to which is the minor road the sign post arm position might, if not at present then eventually be made use of as a warning which though coming too late for a complete stranger, will at least warn local drivers who frequently use these roads

In all roads above 25 feet and in many roads of 25 feet the triangle if not present where needed to day, ought to be present Those who appreciate the traffic problem should press for the institution of an authority—such as the Minister of Transport—who can enforce their erection where needed—a power which he apparently lacks at present

39 *The Steering Rule* —There is sound merit in a custom advocated by the Safety First Committee, which clashes in no way with the inverted triangle proposal and which reads — It shall be the duty of the driver who intends to alter his direction (or his speed) to take all steps to warn or look out for other traffic This should receive all support as a good custom which will of course apply at cross roads or tributary junctions as elsewhere

40 *Accident* —Whatever high degree of orderliness is introduced in road behaviour there will be traffic accidents Statisticians have divided such accidents into classes, and one of the classes include accidents which occur in connection with what is called the private car I pick out this class for note for a special reason It is customary to find in the correspondence in the Press expressions of grim satisfaction when the private car class is observed to be associated ... the public vehicle class ... The grimness is accompanied by some quite foolish ... among which ... driving examination for the licence limitation of speed compulsory insurance exclusion from specified roads, etc

The complainants do not pause to think that the whole of the learning to drive for the 125 000 new motor vehicles which will take the roads of Britain in 1928 must be achieved on no other class than the one labelled private car The rising generation of youths and maids and the new owners of maturer years who ... drive about 100 000 every year, the "private" class Only when by the authorities admissible to —and not till then Accordingly, this class prejudice on this whet just as he is also distorting his the number of accidents in the ... that the number of vehicles in ...idence of the censure Moreover motoring class of traffic unit that number of traffic accidents has no ...ables, and escapes all blame quite remedial measures often suggested

indication ... s, and by ... e sign post ... tion, cheap ... frequenters ... grave ... at present, ... if do not— ... arms are at ... n is sufficient ... an example uses ... The proposal these ... of the warning One of the

in the interests of justice is compulsory insurance—and this subject deserves comment

COMPULSORY INSURANCE OF ROAD VEHICLE DRIVERS

The fact that an uninsured and for present purpose insolvent driver, whether of a cart car or bicycle controls an instrument which may involve accidental damage to others has led well intentioned people to the following line of thought —

When a road accident has occurred in the past the damage to third parties has most often been met from those boundless founts of wealth insurance companies Why not make every one who drives insure? The intention is purely to secure that a blameworthy driver shall provide compensation even in excess of his available means to an innocent third party to an accident As almost half of the vehicles in the country are motor driven and as its enormous utility has given to the motor car an exceptional prominence the question has been discussed mainly as regards the motorist and he, like any one else may prove insolvent

The intention of righting a wrong cannot be objected to It is the method which is under discussion To impose compulsory insurance on car drivers only, is tantamount to proclaiming motorists as always the offenders always responsible and therefore that they and only they, should pay and that in advance Accidents are of three kinds A Unavoidable where no one is blameworthy B Avoidable, where pedestrians, cyclists or other traffic are responsible C Avoidable, where the motorist is blameworthy and responsible To suggest the overwhelming majority of accidents are in Class C is a travesty In the early motoring days the motorists endowed the community with one of its greatest wealth producers—in despite of punishments fines and legal repression In fines for speed limit offences alone he has been squeezed of thousands quite unjustly

Now, it is the right and the duty of any fair minded person to claim that not only the drivers of cars, but the whole community are beneficiaries If as in evolving any other economic advantage, there are unavoidable accidents and risks to other members of the community, there is at least, as regards unavoidable accidents no case for throwing the whole burden on one rather than on the other party to the accident, the motorist rather than the public The fact that motorists have mostly borne such expense by insurance in the past shows that they have rightly foreseen the prejudices which have assailed them not that they should in future have an unjust charge fixed upon them As regards avoidable accidents caused by pedestrians and other traffic there is still less reason for payment by the motorist As regards avoidable accidents where the motorist is blameworthy, the motorist has usually paid for this and should do so—the law of the land has seen to it in almost all cases In the few where the insolvency of the driver has caused the sufferer to bear his own costs there is a genuine hardship

Such hardships deserve to be mitigated The question arises whether this is best achieved by legalizing a definite injustice namely by picking out the solvent motorist who is not to blame rather than any other section of the people and make him pay for the culpable motorist who is insolvent That is what compulsory insurance amounts to The money for compensation must be got somewhere the Insurance Company is only an intermediary—and if it is taken from the Insurance Company it is only available because it was taken first from the pocket of the insuring motorists who are not culpable and mostly not insolvent Yet no one repudiates the offending motorist more than does the careful driver and no one resents more his misdemeanours or seeks more studiously to correct the risks of his bad driving

As a means of diminishing accidents compulsory insurance is illusory The mere fact of being insured will not make any reckless driver of whatever class or wealth more careful—and no diminution of accidents will appear from this cause—rather the contrary

It is true that certain drivers by reason of a run of bad luck as well as certain others by reason of bad behaviour will be refused insurance and under a compulsory scheme This means prohibition from driving such curtailment of their bad luck or bad habits will tend to balance the increase of accidents due to the carefree attitude induced in some of those now for the first time insured

No one knows whether the net result will be a loss or a gain but a substantial case can be made for apprehending an increase of ruthless driving with universal insurance attended by an increase of premiums all round

It is to be noted that where insurance is compulsory refusal of insurance amounts to withdrawal of driving licence without trial by judge or jury and therefore such a severe penalty is

[illegible]
on the motorists partly by increased insurance and partly for club legal expenses or else by fighting the action personally

I have spoken of the compulsory insurance of drivers and not of cars or vehicles for the reason that to refuse to insure a car because of its many accidents is in general illogical It is the driver's, not the car's behaviour that is in question The premium will be greater, as it is to day for a vehicle of greater power, speed, weight and value but the claims for third party damage appear to be only fairly directed against the driver

In such an insurance scheme a man who drives and has a chauffeur and family who also drive, may have to take out six or seven insurances one for each person who may at any time drive, and even so he will be deprived of one of the most potent means

of initiating new drivers in the ways of the road the giving of driving lessons to friends whom he may wish to teach Such driving lessons are rarely sufficiently premeditated to have been foreseen by the non driver for him to have taken out an insurance on the off chance of a driving lesson Of course the law may be evaded, as it is in regard to licenses, but it is regrettable to add yet another class of offence for the motorist

Now the satisfactory insuring of the driver is a difficult matter As we know, the risk to be covered by insurance, as shown by the varying premiums paid to day, varies with the class of vehicle of which that driver is in charge, and with the use to which it is put Drivers change their cars, and adjustments of policies to meet such changes will involve millions of alterations in the course of a couple of years, or if this state of things is intolerable, the policy must be one of maximum cost, to cover the most risky car any driver might take to, or again some schedule of excluded cars might form parts of the policy—all complicated arrangements

Even with this, there remains the most dangerous driver of all —the person who has stolen or borrowed a car without leave, or the person who has ignored the compulsion to insure These may be found guilty of an illegal act, but that would not provide compensation for the injured, which, after all, is the sole reason for the proposal under discussion

Compulsory insurance involves the State in discriminating between and recognizing as acceptable certain Insurance Companies And since rates could be raised indefinitely against those who are not free agents, but *must* insure, the rates would have to be State controlled The correct settling of rates involves all the knowledge and the records of an insurance company—and to *establish a State bureaucracy for this purpose is therefore* involved Mr Armitage contends that " this involves (eventually) State Insurance, and that to be logical it should apply to all forms of insurance, which would not be to the advantage of the Insuring Public "

Foreign insurance companies would not, without making serious deposits in this country, be recognised by the Government for such insurance Accordingly the influx of foreign travellers equipped with cars, who are a source of profit directly and of extended business to England indirectly, would be hampered on entry with the compulsion to insure with the approved companies in England

So strongly was the discouraging effect of such regulations on visitors appreciated in Switzerland in 1927, that this argument alone routed the anti motorists in that country on their proposal for compulsory insurance.

The sensitiveness to injustice which no doubt prompted this proposal in England is fortunately the very sense to which appeal must be made to condemn it It is unjust The tramway, the horsed vehicle, the fresh young horse, the dog, cow, sheep, and

even the rabbit or cat the pedal cyclist and above all the pedestrian are responsible for an immense quantity of accidents in which they as responsible first cause never appear in addition to the many in which they are hurt or killed

The proposal is unwise it is always foolish to do by complicated means and badly at great expense what can be done simply cheaply and well It would be more direct and far cheaper and more just it would leave undisturbed the delicate organism of insurance to form a fund for compensating direct the limited number of hard cases Such a fund must be drawn from the general public including of course the motorist but not exclusively from motorists

It is possible that the well intentioned proposal is in some way due to errors induced by the lure of headlines—I allude to the misleading phrase Motor Car Accident If a platelayer falls under a train it is never called a railway accident—but if a pedestrian falls under the back wheel of a motor car it is a motor car accident The cumulative effect of such publicity together with the difficulty of establishing before a jury of pedestrians that a pedestrian like themselves will and consistently does do such things as cause his own damage has made the impression that traffic accidents are synonymous with motor car accidents and should be paid for by motorists This error is the foundation on which the structure of compulsory insurance of motor car drivers is erected

APPENDIX I

On the Offside Rule at Cross Roads —The following discussion of some examples of this rule in operation seems to show that it is not a fortunate suggestion for solving the problem of Cross Roads and Road Junctions

The offside rule is Any driver must yield right of way to any vehicle which he sees approaching him on his right To this is added by its supporters the apportionment of blame as follows In the event of collision the blame attaches to the driver who should have yielded right of way

Suppose a stream of vehicles is proceeding from London to Bath A milk lorry in a side road on their right intends to join this stream To do so it must first cross the stream from Bath to London and presumably it advances slowly to await a gap therein The stream going to Bath stops in obedience to the rule because the lorry has been sighted on the right Eventually a gap occurs in the stream to London but the lorry cannot utilise it because on its right hand side the second stream of London going vehicles is visible The lorry must await these also perhaps indefinitely Not until the lorry clearly stops for good may the stream towards Bath resume its journey and it does so in fear and doubt lest the lorry should move For the claimed merit of this offside rule is that the lorry is free from responsibility for accidental collision save in regard to the stream that runs Londonward

Another bad effect on traffic flow arises in this same example from the offside rule It is as follows Suppose the lorry had intended not to join the stream towards Bath but to turn towards London—a fact that only the lorry driver knows Then the stoppage of the stream towards Bath would have been entirely gratuitous and wasted These vehicles never need have waited for the purpose later learnt to arise

Accordingly extending this example it will appear that the offside rule actually makes the driver towards Bath behave as if every vehicle visible on a right hand road were also going to Bath, and had the intention and the right to pass in front of him A grave waste of time in half the cases

The gravity of this appears when we realise that on 41 miles of the Bath road a driver going to Bath meets some 200 roads on his right and must prepare to give way to whatever is on these roads whether or not the vehicles on these right hand roads are going to Bath, i e going to use his side of the Bath road

In the above example it is clear that the driver towards Bath in the major road either sees the milk lorry on his right or he does not If he does not see it by reason of some tree hedge or houses he would not yield place for it and the lorry driver expecting to be given priority would proceed as expecting it result—a crash Alternatively if the driver toward Bath on the major road did see the milk lorry he would still have to use his judgment as to whether the distance up the lane of the lorry and its slow speed warranted ignoring the rule or not If

judgment were wrong there would again be a crash just as there would have been in a case of bad judgment without any offside rule

Offside Rule Safety —The offside rule tends to make a driver with a vehicle on his right more cautious He is indeed made excessively cautious Not only has he to pause for 50 per cent of right hand side road traffic which will never have any concern with him but if he is moving at all when a vehicle approaches from his right he is faced with the euphemism that the rule facilitates the apportionment of the blame —in other words he pays To set off against this extra caution and its manifest advantages the offside rule encourages the driver approaching him from his right to be less cautious i e he expects to be made way for

It is clear that this double result is attendant on any system which gives an indication of which of two lines of traffic must look out for the other Let it be a merit of the inverted triangle suggestion that it does not pretend to apportionment of the blame but keeps all parties informed and therefore all responsible and if necessary blameworthy

It has been suggested that one could adopt simultaneously the "offside rule and the inverted warning signs for cross roads They are incompatible Example A driver in a superior road sees a driver in a minor road on his right He stops to give way But the driver in the minor road sees an inverted triangle so he also stops to give way Such a clash of instructions must not occur

It is clear that the offside rule would not have been recommended by anyone if it had no possible occasions when it offers advantages No suggestion of complete unreason is here made What is contended is that the offside rule has no possibility of being obeyed where it is unreasonable as in the examples given that the habit of disobeying it must therefore be engendered that if it is not universal and fully obeyed it increases danger by giving one party a false expectation that way will be made for him and an unjust expectation that he will in any case be held blameless In France where this rule has been promulgated it has become a de[illegible]

[illegible] inverted triangles into operation It is [illegible] subsidiary road crossings some years [illegible] all "warning posted" This is no [illegible] Road Fund is raided Unfortunate as [illegible] so bad as having a rule which it has [illegible] ed has no possibility of being obeyed [illegible] increases the danger It is to be [illegible] annot operate as a "courtesy rule" In suc[illegible] of safety it must be possible to rely [illegible] chauffeur [illegible] inty that the [illegible] r who has to make way does so seven insur[illegible] tional courtesy or rather if it is optional it certainly and even so [illegible] nger Moreover the rule is not susceptible of trial on a run of road or for a limited time

APPENDIX II

On Maximum Flow

A statement made in this paper repeated from my letter to the "Times," April 27, 1927, is sufficiently surprising to require support. It is that *the maximum quantity of traffic flow obtainable from a sequence of cars is approximately reached when they are so driven that the foremost part of every car is about a car's length, say, 20 ft. behind the tail of the next car ahead of it.*

The particular speed that will be maintained by the cars will be determined by the efficacy of their brakes (and not primarily by their engine power, which, in fact, is ample in almost all motor driven vehicles for the speed which is advantageous in view of the brakes). The basic fact is that the driver does not like to be moving at such a speed that if the car in front of him *stops rapidly he must inevitably crash into it.*

Suppose the speed of the car to be "V" feet per second and the de celeration due to the brakes to be "d" ft. per sec.² = while the space required for stopping the car is "s" feet. Now call the length of the car, plus some margin for clearance "L" feet.

$$\text{Then } V^2 = 2ds, \text{ therefore } s = \frac{V^2}{2d}$$

Accordingly, I can now call the distance from the nose of one car to the nose of the preceding one $= s + L$

$$= \frac{V^2}{2d} + L$$

and the number of cars that pass any given line per second is

$\dfrac{V}{s + L} = \dfrac{1}{\dfrac{V}{2d} + \dfrac{L}{V}}$ and the quantity is a max. when $\dfrac{V}{2d} = \dfrac{L}{V}$ which is $V^2 = 2dL$,

hence $s = L$ for the maximum condition.

Applying this knowledge to a simple numerical example take "L" at 20 feet. Take brakes which give "d" at 10 ft. per second² (a good result). Then $V^2 = 400$ and $V = 20$ feet per second or about 14 m.p.h.

If brakes are better, the speeds will be greater with equal safety—on a skidding road the speeds will become less. So the *quantity of traffic flow will become greater or less as the brakes are better or worse,* what will not alter, is that "L" must equal "s" for the maximum amount of flow under each condition of road surface or braking effect.

APPENDIX III

Suggestions for a Code of the Road (A)

Being a Schedule of Useful Customs for Road Vehicle Drivers

Owing to the variety of conditions with which a driver may be confronted, whether by the error of others or by the complexity of traffic situations, all road customs yield before the superior compulsion of avoiding an imminent accident

(1) Drivers keep to the left of the available road space—so far as is compatible with safety and considerateness

They meet vehicles by keeping to left They overtake on the right of the overtaken while keeping near to it They revert to the left when assured of having cleared it Drivers never overtake on the left

(2) Drivers do not overtake a vehicle at "blind" points, e g, a corner, the top of a hill etc where the view beyond the vehicle is obstructed Vehicles do not stand near at or just beyond blind points or other corners save under instruction from a traffic controller Drivers on receipt of a sound signal that a vehicle behind wishes to overtake acknowledge this by signing to the vehicle either to overtake or to beware The giving of a hand signal to overtake does not commit the giver of this signal to any other responsibility than is to his own intended behaviour The giving of a hand signal to overtake commits a driver to avoid accelerating his own vehicle

A driver does not overtake another unless he proposes to maintain a speed higher than that of the overtaken vehicle

A driver prefers to overtake another uphill and avoids doing so down a steep hill

(3) Traffic on minor roads "looks out for" traffic on major roads

Traffic on major roads is not relieved of responsibility towards minor road traffic

(4) Drivers give signals on the right-hand side of their vehicle with the hand to show their intention to swerve to their right, [illegible]

[illegible] their

(5) When [illegible] hich two tracks w[illegible] the priority is ind[illegible] driver who is changing course gives way to the driver who is keeping course.

The driver who intends to alter his direction (or his speed) takes action to warn and look out for other traffic

A driver, in town approaching a road junction at which control is being operated by a traffic controller quits the left of the road and takes station in the queue nearer to the crown of the road unless intending to turn leftwards at the controlled road junction

At such a controlled junction a driver shows to the controller or others in front of his vehicle the direction intended to be taken by him by signs with the hand on the windscreen or by a mechanical indicator of intention

White lines across the road at such places indicate where the front wheels of a motor vehicle are to stop when the controller's signal or other indications are against them At such lines pedestrians may be expected to cross in front of the stationary vehicle

(6) A standing vehicle is drawn up close to the kerb longitudinally i e its length along the length of the road

[illegible] ng " side of [illegible]
[illegible] unavoidable

[illegible] course in a narrow road bearing traffic proceeds till he has passed beyond a side road or gateway backs into the opening and then comes forward in the desired (reverse) direction

A driver of a motor car does not retrace his course in a road in which his vehicle is unable to turn on one lock unless (a) there is no traffic in view and (b) no blind corner concealing [illegible] traffic

In roads of one vehicle width on sighting an approaching vehicle a driver looks for the nearest " passing place," [illegible] it and beckons the other to pass

(8) When an accidental collision is imminent [illegible] by some person's neglect of a road custom, a driver [illegible] minimise injury to persons e g (1) in a cross [illegible] prefers to turn the same way as the vehicle that will [illegible] (2) In a head on crash he strives that wing [illegible] (3) Sooner than strike a car he strikes a dog (4) [illegible] strike a person he strikes a car if this be the [illegible] casualties

The Improvement of Facilities for International Road Travel.

Presented by DIPL. ING. R. FILSER

On behalf of the Allgemeiner Deutscher Automobil Club

In submitting a resolution to the consideration of the World Motor Transport Congress 1927 the Allgemeine Deutscher Automobil Club desires to point out that the freedom granted to automobiles used for touring purposes is founded on the fact that no country requires a special permit for the temporary importation of an automobile and on the régime des triptyques which enables every tourist to effect security for Customs duties in a very simple manner.

This freedom is however restricted in many European countries if a particular vehicle is not used for touring purposes pure and simple, although the crossing of the frontiers for business purposes is more urgent than is the case with touring. That these restrictions have not been felt more seriously as yet may be accounted for by the fact that in many cases it cannot be ascertained whether automobiles serve touring or business purposes. The practice of the triptyque system causes difficulties only in such cases where a country does not permit the issue of triptyques in the name of firms nor their use by the representative of the holder of a triptyque.

Some countries altogether forbid the crossing of their frontiers by motor trucks or require a special permit which often takes months to procure. Only a few countries grant the facilities accorded to touring automobiles to motor trucks and vehicles used for business purposes, viz. Belgium, Denmark, Germany, Switzerland and the Netherlands.

The German Foreign Office recently addressed a letter of inquiry to several neighbouring countries, the replies to which showed that the motives for the exclusion of motor trucks from the facilitated triptyque system in these countries are based on the supposition that an effective control over the virtual use of foreign motor trucks cannot be accomplished. Consequently foreigners might be given an opportunity to carry on a carrier's business in the countries to the disadvantage of inland carriers. It is further stated that the railways will have to encounter great and detrimental competition if international motor truck traffic extends more and more.

Against these remarks it must be said that:

(1) Every foreign motor vehicle is recognisable by its nationality plate. Thus it is possible for any such vehicle to be examined at any time as to the place of origin of the goods

carried The triptyque and tax licence also afford information as to the place and date of the last frontier crossing In virtue of this information one is enabled to ascertain whether the vehicle in question is used for international transport viz to carry goods from one country into another or in transit or between two places belonging to the same country Even taking into consideration an abuse of the employment of the vehicle this would not necessarily mean a cause of impediment to the natural development of international motor traffic

(2) As regards competition between railways and motor transport this is dealt with by the Congress under the heading of Co operation between Rail and Road We therefore do not enter into this question

The best proof of the practicability of admitting motor trucks to the free triptyque system is the experience of the countries which introduced the system many years ago Belgium which but a short time ago was an opponent to the facilitated frontier crossing for motor trucks has now after careful consideration released Belgium triptyques for motor trucks as well as cars

It will be very regrettable if the other countries cannot be similarly converted This would mean a step backward as the countries which have already adopted the system may well find themselves compelled to shut out motor trucks coming from countries which do not grant the same facilities The A D A C therefore moves that the World Motor Transport Congress determines upon the following proposed resolution

That the World Motor Transport Congress requests the Ministries of Transport of Great Britain Ireland France Spain Italy Hungary Roumania Austria Czecho Slovakia Poland Lithuania Latvia and Finland to consent to the crossing of the frontiers by automobiles for business purposes and by motor trucks without a special permit in virtue of triptyques The World Motor Transport Congress in support of this motion refers to the favourable results obtained by Belgium Denmark Germany the Netherlands and Switzerland which permit in part for some time past the crossing of the frontiers to all automobiles without considering their object of application and destination under the same conditions as those to which touring automobiles are generally submitted

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The Necessity for Co-ordination of Rail and Road Transport.

By N D BALLANTINE

Consulting Engineer on Railway and Transport Matters

Submitted on behalf of the Society of Automotive Engineers

The subject, as to the necessity for co ordination of rail and motor transport, is one to which I have given much consideration and I am happy for the privilege of this opportunity to express my views and add my plea for co operation and co ordination of rail highway and eventually airway transportation

I am sure we are agreed that with an increasing demand from the public for speed comfort safety and economy, something must be done of a more concrete nature Many of the municipal studies and surveys are so comprehensive and require so long to complete that by the time a committee's report is made the conditions have changed and the benefits sought are lost The maximum utilisation of our steam roads our streets and highways depends upon a continuous scientific study of what is taking place currently and not upon statistics which are outgrown Some of the losses attributed to motor transportation are really due to economic conditions and some to methods which have not kept pace with progress in the automotive industry

Co operation is a quite common expression in the steam rail transportation field of the United States, but many who use the term do not really understand the essence of their own problems much less the problems of a relative industry An understanding of both sides is essential otherwise, a potential aid may unwittingly become an obstruction A most important step then is to create in the minds of the directing heads of the various forms of transportation that is Transportation Men our duty lies to the public in providing complete transportation service of persons and things in the safest most expeditious comfortable and economical manner by co ordination of the different means

Railroads

The steam railroads are handling the largest part of the freight and passenger traffic and must necessarily continue to do so in caring for mass passenger transportation, long distance traffic, the carload freight and long haul freight Our railroads generally do not oppose motor transportation itself, but rather the disorganised efforts which take business away from them and are yet unprofitable to the majority of the independent operators

Given a condition where an independently operated motor-coach or truck company can make money in competition with a

rail line, it would be an unusual condition where it would not be possible to effect substantial economies between that company and the railroad Each local situation needs to be studied and each transportation facility assume that portion of the traffic which it is best fitted to handle In the case of freight this would mean reliability speed and economy as a general proposition the public is not concerned with the means of transportation if the result is satisfactory In passenger traffic a somewhat different condition exists Safety comfort and speed are the prime factors and the relation of costs is not so vital This is evidenced by the growing tendency of passengers to ride in sleeping and parlour cars also in the greater use of motor coaches in place of railroads wherever possible and in place of electric railways where the fares are from 20 per cent to 35 per cent higher The public will respond with adequate compensation whenever they realise that the whole transportation problem is being approached in a scientific and orderly manner and what is of additional importance the regulatory bodies would undoubtedly welcome such a method and there would be less cause for difference of opinion as to what is adequate compensation

Within the last two years of railroads in the United States have begun the use of motor coaches and trucks Information as to the results from their operation is meagre Sufficient and uniform data must be kept before we can finally judge what is economically sound or make proper comparisons

Passenger Traffic —The passenger traffic shows an emphatic trend to avail itself of better service and more comfortable riding In the past six years the proportion of sleeping and parlour car passengers to total number carried by Class 1 roads in the United States has increased 20 6 per cent This trend is also seen in the additional passengers attracted by the motor coaches And the higher fare rate has been cheerfully paid by the public, showing that improved service and equipment would bring some of the business back to the rails Gas electric and Diesel electric rail motor cars are now used quite generally, with a saving of from 20 to 50 cents a train mile as compared with steam-train operation This is a happy solution for many branch lines where motor coaches cut into the business as the rail motor-cars are clean, comfortable and speedy

Long distance travel is most generally undertaken by train However, on our west coast where climatic and highway conditions are the most favourable to motor coach operation a through route has been established covering 1 180 miles The

type, equipped with

-lations and carrying

der But as a rule,

the average long distance motor coach ride is not over 50 miles It is true that the motor coach lines operate through the most interesting parts of a town and have their terminals nearest to

the hotels I advocate that the railroads should augment their train service in certain localities to include motor coach delivery to the principal hotels This is one of the integrant parts of up to date service

There is territory deserving of transportation service where it would not be economical to build railway branch lines Here motor coaches should be used as feeders to the main line either operated by the railroads themselves or in co operation with a motor transportation company I am convinced that in many places satisfactory schedules can be worked out and followed whereby motor coaches would connect with through trains and there would be a noticeable increase in both local and through passenger business

The leading railroad executives are beginning to realise that it rests with them to regain business by making their service individual Improved equipment and co ordination with motor service is their first consideration advertising their introductory medium and well satisfied patrons their most effective and wide spread means of publicity Trips for special occasions and holidays and day trips to points of historic interest or scenic beauty going part of the way by rail and the balance by motor coach will appeal to many lovers of automobiles discouraged by the crowded highways and cause renewed interest in others who were led away by the newer mode

Freight —The general tendency in the United States is to ship in smaller consignments as the service improves Trade units really regulate the average tons per car for many commodities and the regulating bodies are not prone to change these by increasing the minimum weights required for carload shipments The average l c l loading for closed or box cars is 7 tons while the average weight of the car is 21 tons Approximately every other time such a car is loaded it is with l c l freight Hence the ratio of the pay freight to the dead weight is quite low In 1920 Class I rails handled 16 billion ton miles of l c l traffic, and in 1926 they handled 12 billion ton miles a decrease of 4 billion or 25 per cent Generally the railroads have to provide certain service with which equipment they could with only a nominal increased out of pocket expense handle the traffic now being taken away from them by motor trucks The result is that it is costing them nearly as much to handle the 75 per cent as it did the 100 per cent and the loss of the 25 per cent takes away any profit there might have been on the original 100 per cent

The motor truck and freight train each have their own field As it is now, the trucker chooses the traffic most remunerative to him, while the railroads must carry what is offered to them With coordinated service they could handle all that portion by truck that it is economically sound should go that way, and the rail and truck would, at the same rates make much more profit There is no hard and fast rule by which to determine what should or should not go by truck or rail There is an economic limit of

highway transportation which can only be discovered by actual operation of coordinated transportation facilities The preparation of shipments according to classification would be an important deciding factor
coarse freight car
is relatively short
goods furniture and other commodities which have to be carefully crated or packed to be accepted by rail carriers the truck can economically handle up to 200 miles and the speed with which delivery can be effected cannot be approached by the railroads with the switching and terminal delays involved

England has had store door delivery for many years but it is only in the last few years that it has come into use in the United States One railroad reports that 50 per cent of freight received at its largest terminal is given store door delivery This practice will become more general when the railroads fully realise what it means to them in releasing cars for other business and in relieving terminal congestion and the resultant savings in terminal costs

Class 1 railroads in the United States do not yet know much about the real costs of handling traffic in their terminals but they do know that terminal congestion is causing delays which are unwarranted and uneconomical on the short haul less than carload business

Electric Railways

Electric railways like the railroads are equipped to handle a large volume of passengers and in general it is the most practical and economical way to handle the mass But people have responded to the individual and luxurious appeal of motor transportation creating a new problem for public transportation systems The electric railway industry is giving more attention to improved service and reduced costs than are the steam carriers This is doubtless due to the fact that in many places the inroads of automobiles and motor coaches upon their traffic have made changes imperative if they are to continue to exist

It is in our cities of 150 000 or less that the electric railways have experienced the most difficulty In extreme cases the entire system of tracks has been removed and bus service substituted while in others a co ordination of electric tramway and bus has enabled them to continue operation The Grand Rapids Railway Company of Grand Rapids Michigan, has just been awarded the Charles A Coffin medal for accomplishments in the rehabilitation of its lines in the past two years It has replaced all its old equipment with modern and by increasing operating efficiency and reducing costs it has maintained the same rate of fare and shown a higher percentage of revenue This shows what a desire to improve service, coupled with 100 per cent cooperation in an organisation can do The Detroit Street Railway, Detroit Michigan is using buses for local and tramcars for express passenger service The buses start at point beyond the tram lines in the less populated sections

then run parallel to the rails and make the local stops delivering
placed every few blocks
the business section The
the new service by increased
patronage

Extending service involves either the laying of tracks or providing bus lines It is found in many instances to be more economical to use the bus for extensions and in lieu of present rail service By benefiting sparsely settled communities they create good will for the company and even though it may not bring in a profit it proves to be less expensive than rail service and keeps out independent operators

It is the flexibility of the bus that makes it so popular It has no tracks to restrict it to certain streets and it usually has more advantageous stops Then since the bus fills a certain need created by automotives there is every good reason to coordinate the services of rail and motor

CONCLUSIONS

Can any more convincing argument be used as to the necessity for co ordination than the fact that Class 1 railroads in the past six years have lost 25 per cent of their passenger traffic and 25 per cent of their highest class freight—the less than carload traffic? Or that our electric railways generally during recent years have either obtained or are seeking increased rates to earn sufficient to pay interest on their funded debt? In addition to this we know that a large number of independent bus and truck operators are not showing a profit

The main difficulty in the way of more universal co ordination of rail and motor is the lack of convincing information as to the costs and savings There are few trustworthy data upon which to compare the merits of the various makes of automotive equipment because of the rapid strides and overnight changes in construction combined with insufficient knowledge as to the many variable factors which must be known to properly evaluate and compare

Co ordination should be easier of accomplishment in England where there exists an Institute of Transport and without doubt you have gone far in that direction A year ago a Motor Transport Conference was held by representatives of a few of the railroads in the United States Recently the directors of the American Railway Association recommended a Motor Transport Division and this is to be voted upon by the Association of Rail

transportation service All transportation agencies will find their interests best served by co operation and complete co ordination of rail and motor transport

Benefits of a Co-ordinated Rail and Highway System in New England.

Prepared and subm[illegible]ed by

DAVID L BACON

Supe[illegible]visor of Au[illegible]omo[illegible]ve Equ[illegible]pment New York New Haven and Hartford Ra[illegible]lroad as one of the Delega[illegible]es of the Society of Au[illegible]omotive Eng[illegible]neers

The operation about to be described serves that portion of New England lying between Boston and New York This is roughly a rectangular area [illegible]50 miles long and 100 miles wide including the States of Connecticut Rhode Island Massachusetts and at its south western corner Metropolitan New York To assist in visualising the nature and extent of this particular portion of the United States it may be pointed out that the lines of the New York New Haven and Hartford Railroad cover a territory approximately equivalent to that of the Southern Railway of England the distance from Boston to New York being equal to that from London to Plymouth

POPULATION AND INDUSTRIES

In contrast to some sections of the world where the motor vehicle is acting as a forerunner of civilisation assisting to develop new territory to the point where it can support a railroad we have had to deal with one of the most densely populated portions of the New World and one in which an intricate network [illegible] This area supports [illegible]are mile exclusive of [illegible]olitan district This I understand to be approximately two thirds of the average density of England and Wales

Agriculture has been on the decline for many years and in its [illegible]

[illegible] turn the then modest wheels of industry This multiplicity of small manufacturing communities caused to be built between two and three generations ago a surprising number of short line railroad many of them not over ten miles in length of which over one hundred have gradually been consolidated into the New Haven system as it stands to-day

For many years this network of railroads served well the needs of the times and with few exceptions, paid excellent dividends to the stockholders. Changing economic factors have however, had an important effect on industry and through industry, on transportation. Two of these were the growing substitution of steam for water power—which in large measure divorced the manufacturer from the country stream and allowed him to locate his factory where he chose—and the application of a new principle of manufacture—the quantity production of interchangeable parts. These and other influences encouraged the growth of the large and closely grouped factories of the modern New England cities in competition with which the picturesque mills and workshops beside the rustic waterfalls have been hopelessly overshadowed and in innumerable instances forced to close their doors entirely.

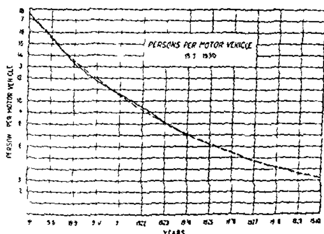


Fig. 1.—Number of Persons Per Motor Vehicle Registered in Connecticut From 1917 to 1925 and Estimated From 1925 to 1930

The result is obvious. The tiny towns which once prided themselves on the prosperity of their toy like branch line railroads are no longer hives of industry, but are either dwindling to a fraction of their one-time population, or have become the suburban or country residences of those who travel and transport their goods, not by rail, but by motor.

Changing Traffic of the Railroads

At the same time, the growth and transportation requirements of the cities have gone ahead rapidly. In the State of Connecticut, whereas the thinly settled areas have been losing inhabitants at an accelerating rate since 1900, the urban districts have, during the same period increased their population by well over 70 per cent. These changes in manufactures and in distri-

bution of population naturally caused great alterations in the demands upon the railroads of the community. The increasing passenger traffic between large cities was offset by the loss in local traffic and, about five years ago, the tremendous improvements in highways, the all but universal ownership of automobiles and the rapid development and spread of the motor coach or bus as a means for inter urban transportation combined to interfere seriously with the equilibrium of passenger traffic as a whole.

Figs 1 and 2 show respectively the change in ratio of persons to vehicles and the traffic density on some of the highways parallel to the railroads. Assuming 2·7 persons to be travelling in each vehicle there would have been a daily highway traffic between two such small cities as New London and Norwich of

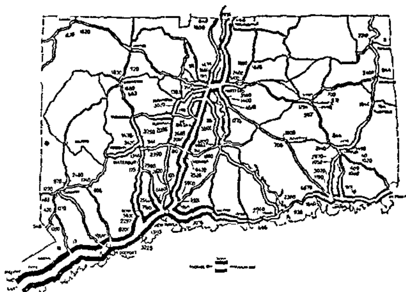


FIG. 2.—AVERAGE DAILY AND MAXIMUM MOTOR VEHICLE TRAFFIC ON THE IMPORTANT HIGHWAYS OF CONNECTICUT, 1923

the loss to the railroad in expected passenger revenue amounted to 27 900 000 dols (approx £5 580 000) annually and that 3 300 000 dols (£660 000) or 12 per cent was collected by independent bus lines. It has also been stated that the total number of passengers carried declined about 40 per cent, this decrease being entirely in short haul passengers.

For some time an unsatisfactory condition prevailed in which lack of co-ordination and keen competition played an important part. The railroad was forced by insufficient passenger traffic to curtail its service. Small companies and sometimes irresponsible individuals ran bus lines regularly about the country.

taking the cream of steady local traffic while through passengers and peak loads were poorly taken care of Certain over enthusiastic exponents of the motor vehicle predicted that the day of the steam railroads was over, and that in the not distant future they would take a minor place in the transportation system of the country It seems, however the belief of those best fitted to judge, that there is business enough for both forms of transportation

This was ably expressed by Professor Cunningham, of Harvard University who in the course of a paper given last year before the Society of Automotive Engineers, remarked In the long run, the form of transportation will survive that has the lowest economic cost for the service rendered In passenger transportation the railroads will continue to take care of the long journey passenger the overnight traffic between large cities and the mass movement of suburban passengers morning and evening Railroad traffic will continue to increase in amount and railroad capacity, in equipment line and terminal will be effectively utilised It is not a question of survival of one and the downfall of the other It is a question of finding the desirable economic balance a fairly definite limitation of fields with wise co ordination, so that each agency of transportation may function in both fields with the maximum efficiency '

This proposed co ordination of various means of transportation is now being used by the New Haven Railroad in an attempt to adapt itself to the needs of the community

Gasoline Rail Cars

It was first agreed that no section of the lines although unremunerative would be considered for abandonment until after every effort had been made toward a further reduction in cost of operation and the establishment of a basis between revenue and cost of operation which in connection with the system as a whole, would warrant the continued operation of such a section

On the strength of this policy two new transportation units have been put into operation The first in date of acquisition was the gasoline rail car Thirty six such vehicles are now in

p and

250 h p

wheels

35 miles

per hour

As against steam trains in branch line service costing about 1 50 dols (approx 6s) per mile to operate in our part of the country, the rail car can be run for half that cost or less It has

on many

of entirely

tances the

team train

line trains

is by no means negligible Through the use of the rail car it has been found possible to discontinue the maintenance of a number of isolated steam locomotives and concentrate such equipment *in larger and more efficient shops*

HIGHWAY BUSES

The second and most versatile assistant to the steam train is the inter city type of highway bus

Somewhat over two years ago the New York New Haven and Hartford Railroad caused to be organised a subsidiary activity known as the New England Transportation Company with the enger service in lic the accommo to use that form nomical and best *adapted to the performance of good service* and *in co operation* to develop arrangements for the furnishing of a complete trans portation service

Starting in August 1925 the service has expanded in two years *until 191 motor* buses are *now* required *to cover 1 245 miles of* highway running up a total of nearly 7 000 000 miles and carrying 4 500 000 passengers annually

A map of the New England Transportation Company s lines is seen in Fig 3 from which it may be noted that the highway auxiliary covers a large portion of the territory served also by steam and in other instances taps territory with which the railroad was not formerly connected Motor buses are now being operated over forty routes averaging 30 miles in length

Because of the relationship between the rail and highway com panies an accounting process is made possible to take charge of the interchangeability of tickets With few exceptions the rate of fare is identical on bus lines and steam trains A traveller starting his journey to any given point even in remote sections of the system can commence the journey by bus and complete it by rail or *vice versa* on one ticket

In the course of mapping out the work of installation and the covering of territory where connecting schedules would prove of benefit to the parent company several instances have been found where it seemed desirable to acquire an existing independent line with all its legal rights and facilities This policy has not been generally followed nor is it the policy of the New England Trans portation Company to seek to purchase an indiscriminate number of independent operators who may have established themselves possibly in the hope that such a purchase might later be brought about

In other cases operating agreements have been made with existing motor carrier and tramway lines In the latter case to protect their interests in territory jointly served the New England Company accepts no local passengers between points served also by electric tramways

VERMONT

NEW HAMPSHIRE

MASSACHUSETTS

BOSTON

MASSACHUSETTS BAY

ATLANTIC OCEAN

CAPE COD BAY

CONNECTICUT

RHODE ISLAND

LONG ISLAND SOUND

NEW ENGLAND TRANSPORTATION CO

OPERATED AND AFFILIATED LINES

OPERATED LINES

AFFILIATED LINES

N Y N H & H R R

Fig 3

The Traffic Department

The Company has a separate traffic department which studies carefully the territory in which service is contemplated That study is made jointly with the officials of the New Haven Rail road and no line is installed until reasonable assurance can be given not only of the character of the country and the condition of the highways over which it will be operated but as to the probable amount of business which it will do and the effect upon the expenses and revenues of the parent company

The traffic department lays out the base schedule to be operated nd the different Division Superintendents are responsible for making additions to meet the traffic demands through double heading or running short line service at different hours of the day or dur ng the week end period In this respect one advantage of a single
especially n
of transport
of the day or week increases the maximum capacity of the equip ment while decreasing idle periods and the necessity of holding large reserves of rolling stock Thus on some lines an excess traffic of 50 to 100 per cent on Sundays can be handled by the temporary assignment of vehicles which normally are run on other routes on which there is no demand for Sunday service

Wherever the operation of motor buses becomes desirable or necessary they are so far as practicable operated —

(a) As an extension of and in connection with rail service making connections with important trains

(b) Parallel with and as feeders to rail service thus enabling the rail service to be scheduled more rapidly and in consequence to be made more attractive to the public

(c) For the filling of rail schedule intermissions where highway operation is justified but where passenger traffic is too light or goods traffic too heavy to justify gasoline rail cars and where through the operation of the highway service these gaps may be filled and

(d) For a highway service connecting with the rail service so far as practicable between certain populous centres where the railroads handle passenger travel but between which the con struction of new or the improvement in old highways has now created a situation in which the operation of the motor coach offers the only means lost

An interesting exan ations is the route from New H The first attempt at transportation other than by horse or ox cart was made about 1830 when a barge canal was constructed between these two points Unfortunately for the stockholders the com petition of steam vessels which soon began plying up the Con necticut River to Hartford and the steam railroads which were rapidly built throughout New England did not permit the barge

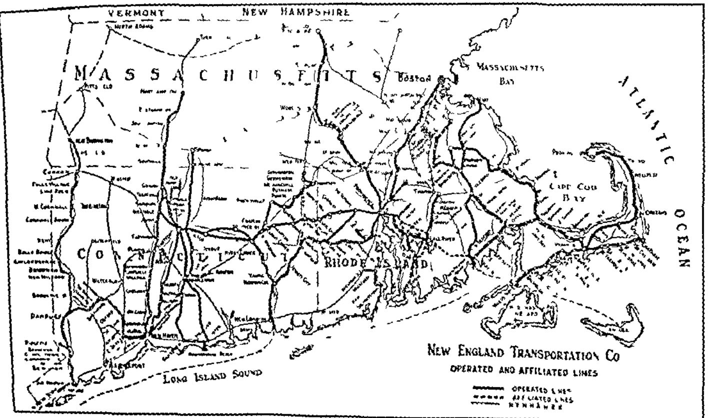

VERMONT
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The traffic department lays out the base schedule to be operated nd the different Division Superintendents are responsible for affic demands through double rvice at different hours of the In this respect one advantage of a single co ordinating management for numerous bus lines is especially noticeable The ability to distribute a certain number of transportation units to cover peak demands at different periods of the day or week increases the maximum capacity of the equipment while decreasing idle periods and the necessity of holding large reserves of rolling stock Thus on some lines an excess traffic of 50 to 100 per cent on Sundays can be handled by the temporary assignment of vehicles which normally are run on other routes on which there is no demand for Sunday service

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An interesting example of the first of these classifications is the route from New Haven to Farmington and beyond The first attempt at transportation other than by horse or ox cart was made about 1830 when a barge canal was constructed between these two points Unfortunately for the stockholders the competition of steam vessels which soon began plying up the Connecticut River to Hartford and the steam railroads which were rapidly built throughout New England did not permit the barge

canal to become prosperous and in 1860 rails were laid on the tow path of the old canal. Steam passenger trains were run here paralleling the main line from Springfield to New Haven until the rail car became available. For some time this formed a satisfactory solution of the problem. As a result, however, of the increasing inroads of automobile competition and incidentally the construction of an excellent concrete highway by the State, this route was one of the first to which buses were assigned. It is now covered four times daily by a single coach which transfers passengers at each end of the run to steam trains for more distant points.

Representative of the second group is the 14 mile run between Fall River and Taunton, connecting also with other lines out of each terminal station. In 1922 with an all steam service there were daily eleven trains each way, of which four were express and seven local. There are now, in spite of increased motor car traffic, a total of sixteen scheduled runs between these points, of which ten are rail trains—eight of them express and two local—and six local bus runs. Of the eight rail expresses six are *covered by steam trains and two by gasoline electric rail cars.* This type of service is obviously beneficial both to the operators and to the public, and it is notable that in a group of such operations the railroad has more than regained the passengers once considered lost. Incidentally the operating cost is generally less than with the former all steam schedule.

The third type of application may be seen between Danbury and New Haven. Here heavy through freight traffic entering New England from the West, and only a light local passenger business have to be dealt with. By putting on a single bus these rails have been relieved of all passenger traffic, and the movement of hundreds of wagons of freight expedited each day.

The Boston New York run is typical of the last classification. Here the railroad operates twenty through express trains a day each way, making the journey in from five to six hours at a cost *of about 8 25 dols (approx 33s). It has been demonstrated that* some travellers prefer to make this trip by bus, a choice which takes about double of their time but saves them 1½ dols (6s) if the trip is made by day, or 3 dols (12s) if they care to drive from nine o'clock in the evening until breakfast time next morning.

This particular route is justified only by the fact that a demand exists for it, such a trip being distinctly wasteful of time. It does not facilitate making connections for branch lines, nor does it relieve the steam railroad of any cares or expense. The travellers on this route seem to be drawn from two classes: those to whom the reduced fare is the chief attraction, and those who enjoy the more leisurely and intimate views of the beautiful New England countryside. Many have predicted the failure of this type of service, considering that the initial traffic was the result of

curiosity and novelty, but this has certainly been amply disproved by many of the long distance bus routes in the Western States, and there is every indication that this vogue of highway travel in the Eastern State is also permanent

The Psychological Aspect of Road Transport

[illegible]

of the pavement while that of its competitor is raised by a matter of four inches The sunny side of the street draws more trade in Northern climates than does the shady side The well lighted display window secures a more favourable reaction from the passing pedestrian than does one dimly lighted or one brilliantly but incorrectly illuminated

These teachings apply to the problem of successful transportation just as forcefully as to the selling of tobacco In one city buses are loaded to capacity from the sidewalk in the midst of the shopping district while 200 yards away across a busy public square trains charging a lower rate wait almost in vain for passengers

Of two vehicles scheduled to leave simultaneously on the same run a long low one with an appearance of speed and power will be filled with passengers while a higher one takes only the overflow Luxury or the Illusion of Luxury is a factor not to be under estimated For soft deep cushions scientifically designed, plenty of leg room and seat backs set at a comfortable angle the travelling public is more indebted to motor coach builders than to railroad equipment manufacturers And although our bus passengers are probably on the average less accustomed to luxury in their own homes than are those who ride on express trains they have been educated by 'bus manufacturers to demand and secure a standard of comfort ventilation and accessories superior to that generally available in rail equipment

In conclusion the operation of highway motor coaches properly co ordinated with the railway to give a complete transport[illegible] service is advantageous to both the travelling public and the parent company and consequently to the community [illegible]

The Necessity for Co-operation between Road and Rail Transport: The Position in Germany.

I

Submitted by the Delegate of the Deutsche Reichsbahn Gesellschaft (German State Railway Co)

In Germany as in other countries the development of the motor vehicle has diverted a considerable part of the passenger and goods traffic from the railways This loss is chiefly felt in regard to distances up to 100 kilometres (62½ miles) and is due to the fact that the motor vehicle offers advantages over short distances which the railway cannot offer The motor vehicle is largely employed for the transport of goods from house to house without the necessity of unloading and re loading, it enters the very heart of the towns which it serves thereby facilitating travelling it is not confined to a definite time table or to fixed tariffs and for short distances it is cheaper than the railway

On the other hand it is of value in feeding the railway and renders valuable service to the community by opening up thinly populated districts where the construction of railways would not be remunerative It can also be employed to advantage as a means of communication between terminal stations in a town and for relieving railway lines with heavy long distance traffic

To a certain extent the loss suffered by the railways owing to this diversion is made good by the transport of products of the motor industry

The German Reich s Railway Company has come to the conclusion—

(1) That the railways cannot hope merely by reducing their tariff and facilitating transport to regain the traffic which has been diverted to the motor vehicle

(2) That co operation between railway and motor transport is in the interest of both means of transport and of the public A struggle between the two would entail heavy burdens on both means of transport and would result in uneconomical undertakings thereby doing harm to the whole national economy

The German Reich s Railway Company therefore concluded on March 29th, 1924 with all large motor companies of Germany united under one mother company a company agreement by which this co operation has been organised in the following manner

If certain traffic is to be diverted from the railway to the motor vehicle a special operation contract is to be signed between the local directors of the Reich s Railway and the motor traffic

company by which the mutual rights and obligations (liability for loss and damage during transport) the tariffs and the distribution of possible surplus profits are fixed Even if no direct surplus profits are realised for the railway either in the one case or the other there remains the advantage that the railway retains the traffic regains lost traffic and prevents any further diversion

In the case of some of such rail and motor lines organised for goods traffic there is co operation with the forwarding agents whose forwarding offices act as receiving depots for goods for the rail and motor traffic

On September 1st 1927 there were 61 railway and road transport lines in operation Of these twenty two are engaged solely in passenger traffic 37 solely in goods traffic and 2 in mixed traffic The passenger traffic lines covered a distance of 310 kilometres (about 194 miles) the goods traffic lines 1 343 kilometres (840 miles) and the mixed traffic lines 15 kilometres (9⅜ miles) In the first half of 1927 116 000 tons of goods were transported covering a total distance of 410 000 kilometres (256 250 miles) 539 000 persons were also transported covering a total distance of 310 000 kilometres (193 750 miles)

The business resulting from the general agreement is carried on by the Office for German Rail and Motor Traffic in Berlin in which the German State Railway company and the motor traffic companies are each represented by a business manager

II

Submitted by the Delegate of the Geschaftstelle fur den Deutschen Eisenbahn Kraftwagen Verkehr (Office for German Railway Motor Traffic)

The number of motor vehicles increases steadily and continually Goods delivery to customers by business houses and works having their own motor vehicles the motor traffic of forwarding agents motor omnibus companies of the towns of public and private undertakings are all still increasing but there is no unity and regularity in the whole traffic service

As a result the traffic is in part diverted uneconomically and to no purpose from the railway Owing to this diversion the railway incurs unnecessary losses of receipts in both passenger and goods traffic This causes the railway to take steps to counteract this in the way of organisation and tariffs which render necessary yet further methods which are not always profitable and which prevent a sound development of railway traffic Through all these circumstances the public are harmed the railway suffers loss and the motor vehicle does not achieve its object

Route des Alpes extending from Nice to Evian *via* the mountain passes. Over a good part of the route roads were already in existence and only needed local improvements. The only important section which required to be constructed was one between the upper Arc Valley (Bonneval) and the upper Isere Valley (Val d'Isère) over the Iseran Pass at a height of 2 770 metres (9 085 feet) above the sea, the terminating point of the projected touring road. Circumstances have not so far not permitted the construction of this section, although its execution now seems near at hand. Fortunately it was meanwhile found easily possible to find a different itinerary, which was done, and after very careful surveys the Route des Alpes, although in some quarters regarded at the time as being somewhat daring, was opened in 1911.

Present day Services.—At the present day various services are in operation over this road. The most rapid enables the journey between Nice and Evian, or *vice versa*, a distance of 630 kilometres (393¾ miles) to be covered in three and a half days, the vehicle travelling over seven great passes, five of which rise to a height of over 2 000 metres (7 120 ft.), the highest, the Galibier Pass, reaching 2 550 metres (8 364 ft.).

One optional service occupies five and a half days and passes through Annecy, Aix les Bains and Grenoble, the total distance covered being 735 kilometres (459⅜ miles). New branch services are run in conjunction with those operating over the main artery of the Route des Alpes. The latter has also been extended to the north at first by the services on the Route du Jura, then towards the Auvergne and the Cevennes by a junction transverse service from Grenoble to Le Puy, this also being extended on one side towards Vichy and on the other towards Les Causses, where it connects up with the services of the Orleans and Midi railway systems. Finally the Route des Alpes service has been extended along the Riviera coast and to La Provence by a service from Nice to Marseilles, which latter is also provided with an extension to Avignon.

The whole of the Route des Alpes services are in operation from July 1 to September 20, a few sections being started on June 15 or even June 1.

Moreover, for several years past a winter Route des Alpes service has been run between Aix les Bains, Grenoble and Nice, the journey occupying three days, this service having also proved a great success.

Progress

A few figures may be given to show the steady progress of the P. L. M. touring motor coach services.

In 1911: 22 services of a total length of 1 225 kilometres (765⅝ miles), representing 140 625 vehicle miles.

In 1913: 36 services, 2 760 kilometres (1 725 miles), 318 750 vehicle miles.

In 1921: 40 services, 4 300 kilometres (2 687½ miles), 437 500 vehicle miles.

In 1924 85 services, 9,600 kilometres (6,000 miles), 775,000 vehicle miles

In 1926 156 services, 18,700 kilometres (11,687½ miles), 1,567,500 vehicle miles

It may here be mentioned that last year the number of passengers carried amounted to 250,000 and the receipts to 12,000,000 francs

Scheme of Working

The plan of working adopted by the P L M company is that of granting concessions for the running of the services to private concerns, the concession including a guarantee scheme, which enables the contractors to cover their expenses The Railway Company closely controls the running of the services, draws up the time tables, fixes the fares, and decides as to the type of vehicle to be used

The vehicles employed on the services have under the impulse given thereto by the P L M Co made very great progress in recent years from the point of view of comfort The most generally used type are Pullman 14 seated coaches, having five rows of three armchairs The express services are maintained by eleven seated vehicles the armchair seats being arranged in four rows of three The winter service vehicles are partially closed, a detachable cover being provided over the three rear rows of seats

The average running speed variable, of course with the routes followed, is generally from 15⅝ to 18¾ miles per hour

The fares which are also variable in accordance with the more or less difficult nature of the route average about 70 centimes per kilometre (a fraction over 2d per mile, at an exchange rate of 124 francs to the £) The seats which are all numbered, may be booked in advance

On the services which have the heaviest traffic, light motor vans for the transport of passengers' luggage are employed

Other French Services

I will not extend these notes by referring at length to the organisation adopted by the other French railway systems, which, in general, follows that of the P L M Co

I will therefore only mention among the principal services

- The Routes des Pyrennees, from Biarritz to Cerbère (543¾ miles), or to Carcassonne (512½ miles) in six days, with an extension from Carcassonne towards Les Causses
- The services in the Vosges of the East France and Alsace-Lorraine systems
- The Route de Bretagne of the Orleans Co and its various services in Brittany, to the Castles of the Loire area, in Auvergne, &c

Such is briefly, and, in a general way, an outline of the motor road service organisation of the French railways I am aware that numerous and well organised tourists' motor services exist in many countries Nevertheless, the French organisation, which is well advanced, and in which the French railways take a preponderating part is, I consider, worthy of being brought to your notice It enables the extremely varied districts of France

to be visited in detail, and it opens up not only to foreign visitors, but also to many French people, numerous beauty spots formerly but little known

The Role of the Motor Vehicle apart from Touring

The foregoing remarks deal exclusively with the motor vehicle from the touring point of view The automobile is, however, a valuable auxiliary to the railway in many other respects

Public Transport Services

There exist in France, as in many other countries, numerous public transport services These may be classified in three groups—free services, services run in accordance with the regulations of, or with subsidies from, Department and communal authorities, with or without State aid

The free services are subject, so far as regards traffic, to the special regulations of the French Road Code Act of December 31, 1922 which contains rules regarding the age and capability of drivers the passing of the vehicles by the administrative authority the display of fare boards, &c From the administrative point of view the organisers of such services have only to fulfil a simple declaration formality before the Prefect of the Department

The services controlled or subsidised by Departments or communes are subject as regards fare tariffs, the districts served, time tables &c to the control of the concession granting authority Subsidised services in which the State participates are subject to more closely defined rules They are now controlled by the Act of August 21, 1923 Organisers of passenger services must provide on certain days and at least once a week, a service in each direction capable of conveying 15 passengers and 6 cwt of luggage They also provide the postal service Goods carrying services must carry at least three tons, this being [illegible]

under a concession is prevented The services in this category are therefore generally speaking, complementary to the railways and assist in the development of traffic

Forwarding Services

Finally it may be noted that the bulk of the forwarding service in connection with the delivery of goods sent either by passenger or goods trains, formerly effected by horse-drawn vehicles, is now done by means of motor 'buses or trucks which enables a much wider radius to be covered Thus the P L M Co has now no fewer than 118 express delivery services and 116 ordinary services in operation, these serving over 500 localities, some of which are from 30 to 37½ miles from the railway

In conclusion, whether it is a case of passenger—tourist or otherwise—or goods transport, the motor vehicle enables the zone of influence of the railway to be greatly extended Moreover, road motor vehicle services can be adapted more exactly to the

traffic requirements of any particular district Over and above the main railway system, the secondary lines and the local railways, the motor vehicle forms a sort of capillary system which can penetrate every corner of the country, developing traffic and the exchange of commodities, in other words, life

THE MOTOR VEHICLE AS A COMPETITOR TO THE RAILWAY

There is however, as I stated at the commencement of this paper, another and less satisfactory side to the question—that of the motor vehicle as a competitor to the railway Although this is not my subject I consider it necessary to refer to it in may not be regarded as

it the motor vehicle when it lway for which the latter is will clearly be that each form of transport should deal with the traffic for which, by its character, it is best suited

To come to actual rather than mathematical figures one may admit that the vehicle kilometre cost—coach bus or 5 ton truck ranges between 4½ and 5 francs (this being equal to from 13 94d to 15 5d per vehicle mile) and that the cost on the main railway system is 30 francs per train kilometre (approximately 7s 9d per train mile) or about six times more It must be remembered, however, that whereas the Alpine coach and the motor bus are only capable of carrying 14 to 20 passengers respectively a P L M express train can accommodate from 500 to 1 000 passengers according to the class of railway carriage, or from 30 to 50 times as many A P L M goods train carries on the average 280 useful tons equal to a fleet of sixty 5 ton trucks

It would seem therefore that after a period of experiment more or less laborious and more or less difficult, each method of transport should spontaneously tend to adapt itself to the importance and character of the traffic to be dealt with The main obstacle to this natural progressive adaptation is the entirely different set of conditions applied to the two forms of transport

Not only does taxation bear much more heavily—in France at least—on rail than on road transport, but also the motor vehicle has the free use of a road system constructed and maintained at the cost of the public, a state of things which is all the more serious inasmuch as the modern vehicle causes considerable wear of the road Thus it is that the problem of the competition of the motor vehicle with the railways is attracting attention at the present time to a varying extent in many countries One of the most notable instances is that of Switzerland, where the Federal railw ay auxiliary undertaking, d transport, and acting as raffic to the railways with the object of leaving only such transport work for the motor trucks as they can perform more advantageously than the railways

In France the same question is also becoming steadily more acute

The number of motor vehicles is, in fact, progressing at a very rapid rate in our country, there being in 1926 about 720,000 vehicles, or one for about each 55 inhabitants This number may appear small to our American friends, the United States having, I believe, one motor vehicle for each five inhabitants For us, however, the number is considerable, and moreover it shows an increase of 25 per cent over 1925 It does not include the 175,000 motor cycles sidecars and cycle cars Touring cars figure in the total to the extent of 453,000*, trucks and vans account for 245,000, and public service vehicles for about 25,000 **

This increasing competition is creating grave problems for many local railway undertakings, indeed for many it is a question of life or death, a state of things to which the public powers that be are not remaining indifferent

Even as regards the main line system the railway authorities have been forced to consider, at least in the most affected centres what measures must be taken to ensure a reasonable division of the traffic between road and rail The P L M Co , for example is at present engaged in studying the problem in respect of the busy industrial area embraced between the cities of Lyons St Etienne and Grenoble cities with respective populations of 565,000 200 000 and 85,000 inhabitants with a total population of 2,200 000 for the three Departments

Rail Motor Coaches

To be complete the matters dealt with above should include a reference to rail motor coaches, the adaptation of which to railway operation is not without certain technical difficulties but which, however may on many secondary lines provide useful solutions, intermediary between the motor bus and the train for streams of traffic ranging between 60 and 100 passengers Trials with such vehicles are at present being made in France on both secondary and main lines, among others, by the P L M Co

CONCLUSION

Such is a rapid sketch of the many aspects of the problem of the complex relations between the motor vehicle and the railway, problems for which doubtless solutions will be found in the years to come

Wh[illegible] from the existing condi[illegible] it, I like to think that [illegible] valuable auxiliary to the railway, seeking and bringing traffic from the most remote areas, and intensifying everywhere the economies of life It is from this aspect that the P L M Co has envisaged the motor vehicle from its introduction, and I am convinced that herein lies its lasting *rôle* in the future

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* as against 5,400 in 1901, 37,600 in 1909 and 107,500 in 1914

** Regular public motor vehicles which, in 1913, covered only a distance of about 3,1[illegible]5 miles, are now being run over an aggregate itinerary distance of 37,500 miles.

The Development of Government-Owned Road Motor Transport Services in South Africa, worked in conjunction with the Railways by the South African Railways and Harbours Administration.

By Sir WILLIAM HOY
General Manager South African Government Railways and Harbours

And submitted by G G ELLIOTT
Advisory Engineer to the High Commissioner for the Union of South Africa

In the first place it must be stated that the railways operated in the Union of South Africa are with a few minor exceptions, State owned and in this respect the conditions differ considerably from those obtaining in most European countries The Railway Administration is in no way concerned with the construction or maintenance of roads which come within the jurisdiction of the Provincial Governments of the various provinces of the Union The Provincial Administrations concerned are empowered to levy taxation for various requirements within their respective provinces and in addition receive a subsidy from the Central Government Funds obtained in this manner are devoted to provincial requirements which include the construction and maintenance of roads

THE FUNCTION OF THE MOTOR ROAD SERVICE

South Africa is a country of huge distances and the primary function of the State owned road motor services is to develop the outlying districts at present remote from rail communication and by this means assist the large farming communities in such areas to extend their operations and at the same time to enable them to have speedy access to the markets Another important function of the services is to bring in traffic to the railways, and it has been the constant policy of the Administration to avoid running motor services alongside railway routes It may

also be recognised that there are areas where road transport is preferable to rail the railways in such areas being employed mainly for the conveyance of heavy bulk traffic

SOUTH AFRICAN ROADS

The physical conditions in South Africa are fairly severe In most of the country districts earth roads are all that are available and roads of this type demand a vehicle with a light axle load In the main the road surfaces are somewhat rough, severe grades occur in many areas and during the rainy season some

the roads become practically impassable for wheel traffic of any description. Notwithstanding the severe conditions, the aim of the Railway Administration is to maintain services throughout the year and, while a high standard of road is not insisted upon, it is a condition before introducing services that the roads should be placed in sufficiently good order to afford reasonable prospects of an all the year round service being maintained. The Administration makes considerable use of vehicles of the six wheel type, brief details of which are given under the heading "Types of Vehicles" below. The adoption of this type of vehicle in certain areas has minimised the road problem to a great extent, and it has been found that six wheel lorries can negotiate rough roads with comparative ease, and without serious damage to the lightly constructed "veld" road.

Mileage and Traffic

The rapidity with which the Government owned road motor services has extended during the last two years is illustrated by the fact that in January, 1926, the total route mileage operated by the Railway Administration was 1,218, and at March 31, 1927, it was 4,282, an increase of 3,064 miles in fourteen months. Between April 1 and June 30 of the current year new services were inaugurated or existing routes extended in fourteen different areas, representing a further increase in road service mileage of 429, or a total at June 30, 1927, of 4,711 miles. In addition to these existing, several additional services have been authorised and will be introduced during the course of the next four or six months.

The services operate in different areas, widespread throughout the Union, many of them serving districts more than 100 miles distant from the nearest railway station, and in one case over 200 miles. The services are primarily designed to enable farmers to place light perishable produce on the markets quickly, and in this connection the facility has been of inestimable value in developing areas in which progress was being retarded by the absence of a [illegible] rapid transport facilities. In addition to light goods and parcels traffic, passengers are conveyed, accommodation being provided in the lorries for approximately nine Europeans and twelve non-Europeans. The services are appreciated and well patronised by the communities concerned, and during the twelve months ended March 31 last, 493,924 passengers, 24,891 tons of goods and parcels—comprised principally of small consignments of light traffic—and 196,531 gallons of cream were conveyed. The total vehicle mileage run during the period mentioned was 1,218,793.

Types of Vehicles

In certain areas now served by motor transport, traffic has increased to such an extent that it has been necessary not only to augment the plant, but to provide vehicles of much higher carrying capacity. Traffic requirements on some of the routes

to day demand the replacement of the 1½ to 2 ton carrying capacity four wheeled lorries which were placed in commission at the time of introduction of the services by vehicles capable of conveying a load of from 3 to 5 tons

Unfortunately the use of large capacity vehicles is restricted on account of the small axle load permissible over veld roads This difficulty however is partly overcome by the introduction of six wheel vehicles

The six wheel vehicle has given good results in South Africa and this is a proof of the utility of this type of lorry when it is considered that in many areas they are working over rough roads with steep gradients In certain areas in the Union heavy rains occur during a portion of the year and the roads almost become impassable During last summer six wheel vehicles were able to maintain a scheduled service when the state of the roads due to muddy conditions rendered it practically impossible for ordinary touring cars to move

The following are the main advantages claimed for the six wheeler —(1) *Life of tyres increased by fully 100 per cent* (2) Better distribution of load owing to the additional axle provided (3) Risk of skidding minimised (4) Brakes on four rear wheels (5) Four wheel drive

The conditions in South Africa where the dust trouble is pronounced and where during certain seasons of the year heavy mud is encountered demand that so far as possible all working parts should be protected against the entry of grit and dirt and that lubrication of the transmission springs bearings etc should be enclosed and *preferably* carried out by the gun system of lubrication Wearing parts should be reduced to a minimum and shackle pins joints bushes and other parts requiring fairly frequent replacement should be as large as practicable The wearing parts should be made easy of access in order that replacements and examinations can be carried out expeditiously Powerful brakes on the rear four wheels are essential and should be actuated independently so that the vehicle is not out of control in the event of a partial failure An auxiliary gear which with the ordinary gear allows of eight forward and two reverse gears has been found essential where difficult country has to be traversed

As both goods and passenger traffic are catered for the majority of the bodies provided on the chassis have been specially designed to meet the peculiar traffic conditions obtaining Dual purpose covered bodies are provided on most of the lorries the front portion being fitted with comfortable spring seats for European passengers the rear portion—which is separated from the front by a wooden partition—being used for the conveyance of goods traffic Upholstered seats in the rear of the vehicle are provided for native passengers

Rates and Fares

With a view to assisting the farming community to the utmost extent rates and fares have been calculated on the lowest possible basis consistent with the cost of working the services Passenger fares are 3d per mile for European adults children under 12 being conveyed at half fare The tariff applicable to goods parcels and luggage is also low as will be seen from the appended table of charges —

Miles	Rates per 100 lb s d	Miles	Rates per 100 lb s d
15	0 9	70	2 1
20	1 0	80	2 3
30	1 3	90	2 5
40	1 6	100	2 6
50	1 9	150	3 2
60	1 11		

Heavy Transport

Up to the present the Administration has not embarked upon the conveyance of what may be termed heavy traffic on any considerable scale The conveyance of heavy traffic particularly seasonal traffic such as maize and wool is a difficult problem The period during which such traffic is offered is restricted to a few months of the year only and a large plant would be required in order to move these commodities with reasonable expedition Much of the traffic of this description will not bear a rate sufficient to cover the cost of road motor transport particularly when it is remembered that if a large number of vehicles is employed which would perforce have to remain idle for a considerable portion of the year depreciation and interest charges would continue during the period when no revenue is being earned

Experiments are now being conducted in regard to the conveyance of medium heavy traffic The citrus crop in the Muden district of Natal is now being transported by tractor and trailers to railhead at Greytown Station a distance of 20 miles The conditions in this area are severe the road rises 2 000 feet in ten miles severe curves are frequent and the ruling gradient is 1 in 10 Approximately 3 000 tons of citrus will require to be transported within a period of four months

If experience demonstrates the practicability of hauling heavy traffic by mechanical transport at economical cost *the experiment* will have a far reaching influence on the development of the various classes *of farming operations* in the Union of South Africa

The Necessity for Co-Operation between Road and Rail Transport.*

By Major JAMES PATERSON M C and J B OSLER, O B E M I A E

(Submitted on behalf of the Commercial Motor Users Association)

The word co operation can be used in more than one sense It may mean the actual arrangements for working together or it may mean partnership that is minds working together with a common interest each mind operating its chosen means of transport untrammelled by the specialized organization of the other, or its professional tradition—and jargon ! In what follows we have the latter meaning in our minds

Such co operation as existed in the 19th century between road and rail started by being one in which the old road transport interests predominated and the road carriers brought their traffic to the rails, and in some instances ran their own vehicles on them Then as railway companies became carriers there was a period of equality but this gave way to a phase when the railway companies became very predominant associates—it would be impolite to use the word ' partner to such a low ebb was road transport brought during the latter years of that century

In the days when the horse the steamship or the man with or without the help of wheels were the only other means of transport railway companies provided arrival and departure places at their stations, but did not need to do more because the speed of movement by rail was so great and the cost so low that traffic was attracted to it

It soon became clear however, to railway companies in several countries especially where distances were comparatively short, that both goods and parcels traffic should be given a complete service from the place from which it was to be moved right to its destination, and, owing to the superiority at that time of the rail over the roads, the rail was used for as great a distance as it could be, and the road for as short a distance as possible because only on the rail was there a self propelled vehicle

In Great Britain Parliament had fostered such machines on rails, but throttled them from roads In other countries where Parliament did not interfere it is strange that so few attempts were made to evolve self propelled vehicles on the roads during the years of the 19th century when those on rails were becoming larger, more efficient and more speedy, an exception being India where steam trains manufactured in Britain were used on the trunk roads

* The paper expresses the Authors' personal opinions and must not be taken to be the opinion of any Companies with whom they may be connected.

In America the predominance of the railroad was helped by the great distances to be traversed, and in Britain by the privileged position of railway companies under their Acts of Parliament, and by the interpretation by the Courts of Law of the "rebate" to be allowed from the "collected and delivered" rates, if a trader performed his own cartage—an interpretation which we may be forgiven for considering very favourable to railway companies

The Modern Road Carrier

The coming of the self propelled vehicle on roads at the beginning of this century revived the independent spirit which the pre railway road carriers had so strongly and modern road carriers have revived or have grown up afresh, and are still growing, to equal in dignity and in extent of operation the road carrier of the coaching days—and indeed so far exceed them even in proportion to population, as our people now are all constantly on the move like ants whereas 120 years ago the only travellers were the few scholars peddlers soldiers and the nobility and gentry

It is always very hard on great institutions which have flourished for many years without rivals when some new invention is made which they do not at first take up vigorously themselves, and when those who have been pioneers of the new invention having at last made a success of it grow up" and assume equality of status We have before us examples of surprising "growing up not only of our own children, but also in the British Empire, whose constitution is being adjusted gradually as its members grow to manhood" status

The revival of road transport is so recent that men engaged in it to day are mostly pioneers of their own businesses, and have built them up by giving a good service to the public and both they and the men working with them have a keen business outlook Men who have grown up in new and rapidly progressing enterprises are not generally so short sighted as to regard themselves solely as people who have to do only just so much as their masters make them do in exchange for their wages

Not only is modern road transport flexible, but so also are the minds of the men engaged in it

Road and Rail Service Co ordination

Many road transport businesses are comparatively small, and the thought of co operating with vast undertakings with great traditions positively frightens them especially as there is in almost all vast undertakings difficulty for either a customer or a competitor to find out precisely who the business man is, whom he can meet and do a deal with on business lines

And may we suggest that if this difficulty is great in a country like Britain, where the railways are run by companies under a semi public and semi commercial system how much greater it must be in those countries where the railways are owned and operated by the State?

We have now perhaps said enough as to the history of this subject and as to some of the difficulties due to history and tradition that have to be overcome We have also shown that the existence of road transport makes passengers and traders consider the complete journey they desire to make because for all short journeys in highly developed countries there are two alternative methods of movement

Manufacturers and both wholesale and retail suppliers are particularly attracted to day by any means of transport which can offer them delivery of their goods direct from the factory warehouse or store to the consignee with little handling

To provide a complete journey railway companies—except where the customers have rail sidings—must include services on the roads whereas the need to co operate with railways does not come strongly before those providing road transport unless they take the trouble to think out the problems of transport from the public s point of view—a point of view just a little wider than some people are usually inclined to consider

The public interest is of course to use to the fullest whatever they have invested their money in unless and until it becomes clearly an obsolete investment to be scrapped in favour of some thing more efficient

When the railway replaced the coach and horses the whole of the capital of the latter was lost to day when the road motor car is available either to replace rail movement—or to cope with a certain proportion of the increase in general movement of persons and goods which has arisen—it may well be that some part of our investment in railways is obsolete and should be scrapped Few however would be found to say—even in a small island like Britain or Ireland—that any substantial part of our invest ment in railways is obsolete Road carriers who had horses horse stables and horse vehicles have of course had far more difficult problems all or almo t all their plant and properties have become obsolete and have had to be ruthlessly scrapped and they have had to re equip themselves with new motive plant at first of primitive and inefficient type costing a great deal more capital than the old They also had to learn engineering—their knowledge of horse mastership being of no further use—and they have had to evolve a new basis of knowledge in respect of costs of moving tons and cwts per mile etc

It would therefore seem that those engaged in working railways should desire co operation with modern road transport—by co operation we mean partnership on an equal basis and for the public good—so that wherever the railway can offer either passengers or goods a service equal to or superior to any other there should be available services by modern road transport of access to and delivery from the points where the rail transport respectively begins and ends—and then the public would have available a complete movement

Arrangements for complete services exist in the United Kingdom for both goods and parcels traffic generally involving two transhipments with perhaps the criticism that in some cases the road part of those services has not yet been [illegible] ed

Big cities and [illegible] nd transport organisat[illegible] main their urban and su[illegible] operation with these on the part of railways fo[r] delivery of goods and parcels to outlying districts is now in existence in many places in this country and often results in a quicker and cheaper service to the public by ensuring full loading of the delivery vehicle which might not be attainable daily or twice daily by vehicles collecting or delivering only such goods as had passed or were to pass over a railway More perhaps might be done in this way

Conveyance of goods in bulk in containers suitable for mounting on both road and rail vehicles is being slowly developed both in the United Kingdom and in North America and more still can be done in this direction

PASSENGER TRANSPORT

Co operation between road and rail companies for passengers has not been developed much in some directions—for instance, in London at King's Cross and St Pancras railway stations, how hard it is for passengers arriving by train to get to a tramcar omnibus or the local underground railway without serious danger to their lives and considerable walking and delay and at the station in the suburbs one of us uses daily there are about 40 private motor cars meeting an evening train from London driven by the wives of the men of moderate means or the hired servants of the rich [illegible] there by [a]rrangemen[t] [illegible] of these travellers [illegible] who would welcome a cheap and reliable way of getting home more quickly

One would expect those who work for wages in both rail and road transport to favour co operation they have in most countries a higher wage scale than that of other industries more subject to competition from outside and severe competition between road and rail would threaten the standard of life that they have attained

We have shown that the public interest is for such co operation and in the case of railway companies and also many road transport undertakings in this and other countries the widespread shareholdings in small individual quantities make it hard to separate the "Capitalists" from the "General Public" If all the foregoing are for co-operation, what are the opinions of the "managements"?

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